ESSAYS ON FINANCIAL SYSTEMS
WITH SPECIAL ATTENTION TO THE UK AND GERMANY

by

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A thesis submitted to
The University of Birmingham
for the degree of
DOCTOR OF PHILOSOPHY IN ECONOMICS

Institute for German Studies
The University of Birmingham
December 2003

ABSTRACT

Financial systems can be compared according to the degree volatile assets are transformed into more stable assets for households and private investors. A discrete-time macroeconomic portfolio model distinguishes between financial systems via a parameter for this transformation by financial intermediaries, which build up and draw on reserves. A comparative-static analysis shows that aggregate income in market based financial systems is less sensitive to profit expectations unless the capital gain effect and its impact on consumption becomes dominant. Depending on the transformation by financial intermediaries, both credit and equity finance can in principle be analysed in the same way but especially venture capital companies in market based systems refrain from offering any degree of transformation. A UK-German survey indicates considerable funding gaps. German respondents perceive a higher degree of normative equity gaps and risk mitigation as the most effective policy instrument. Guarantees reinforced the differences between the financial system and motivated companies to invest in higher risk areas for which they have not developed adequate instruments of relationship funding. In a downturn public guarantee pay outs reduce losses for private investors and exert a stabilising effect on the industry but hamper a restructuring.

ACKNOWLEDGEMENTS

The Institute for German Studies at the University of Birmingham offered facilities, activities, discussions and a two-year scholarship which allowed me to explore several issues of financial systems. I am grateful for the lively discussions which were a great support and motivation. The main ideas and the models presented in chapter 2 were developed at the Institute and apply some aspects of Keynesian macroeconomics and the endogenous money approach to the analysis of financial systems. Some material I collected and worked on at that time refers to further aspects of financial systems that are not covered in this thesis. It was partly published together with Jens Hölscher, my supervisor, as articles in collective works, utilised for research proposals or simply presented in workgroups of the Institute. The models in chapter 2 were also presented at a 'Money, Macro and Finance-Conference' at Imperial College in London and at 'Money, Investment and Risk-Conference' in Nottingham. I would like to thank participants for useful hints.

Chapter 3 and 4 are mainly based on my work at the University of Cambridge for an Anglo-German Foundation funded research project on 'Regional Venture Capital Policies in Germany and the UK'. It was conducted with Ron Martin, Peter Sunley, Britta Klagge and Christian Berndt. I am grateful for the Foundation's financial support and the discussions with Ron Martin in Cambridge. I would also like to thank my contact partners at KfW in Frankfurt, Jörg Oelschläger and Volker Zimmermann, for the co-operation in the production and circulation of the postal questionnaire, Diana Day in Cambridge for assistance in coding survey responses, and many interview partners in the UK and Germany for giving up their time to discuss the state of the venture capital market and public policies.

Last but not least, I am very grateful for the support from my supervisor Jens Hölscher and the comments from the examiners, Andrew Mullineux and Stephen Frowen, on an earlier version of this thesis.

London, May 2005

"The object of our analysis is, not to provide a machine, or method of blind manipulation, which will furnish an infallible answer, but to provide ourselves with an organised and orderly method of thinking out particular problems; and after we have reached a provisional conclusion by isolating the complicating factors one by one, we then have to go back on ourselves and allow, as well as we can, for the probable interaction of the factors amongst themselves. This is the nature of economic thinking. Any other way of applying our formal principles of thought (without which, however, we shall be lost in the wood) will lead us into error."

Keynes (1936, 297)

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

A considerable number of theoretical and empirical comparisons between financial systems have been conducted over the last decades. They form the context for this PhD-thesis. The academic discussion was mainly motivated by European monetary integration and the question whether a single monetary policy would be suitable for different financial systems. Comparisons between financial systems also resurfaced with regard to the transition process in Eastern Europe and to competitive advantages for funding high-technology innovations and new start-up companies. A common distinction is usually drawn between so-called US and UK style market-based economies and German style bank based economies. In the later case the banking sectors plays a dominant role in providing funding for investment and business activities. Whereas in the UK the capital market is seen to play the dominant role in corporate governance of firms and in providing funding.

For Germany the impact of globalisation is often perceived as a driving force towards liquid asset markets, which are diminishing the traditional role of banks. New regulations may reinforce this development. Public state guarantees for state owned banks had to abolished according to an EU ruling. New liabilities created after July 2005 do not have the benefit of the guarantee anymore. Basle II with its increased capital adequacy ratio for banks that provide loans to firms with high risk investment projects will come into effect in 2007 and may further diminish the dominant role of banks in providing funding for investment. German banks may, however, partly divert their activity towards consumer loans which entail a more straight forward individual risk assessment, especially when they are backed by consumer assets.

The dominant view in the economic literature suggests that the comparative advantage of banking in providing finance to firms might be diminished when capital markets become more liquid and deep (for example Stiglitz 1992a, Schneider-Lenne 1992, Walter 1993, Schroeder/Schrader 1998 and Walter/Smith 2000). This argument is also put forward by the French circulation school, when credit creation and endogenous money are interpreted as features of an underdeveloped overdraft economy, that would disappear in a developed financial market economy (Renversez 1996). However, in contrast to the dominant view path dependencies of economic systems may rule out any automatic development towards a market based system (Schmidt/Hackethal/Tyrell 2001).

A development towards market based systems may not necessarily increases the efficiency of the economy. First, some financial intermediaries build up or draw on reserves and hence transform volatile investment assets into more stable assets for households. This transformation has been coined 'intertemporal smoothing' (Allan/Gale 1995). This intertemporal smoothing effect in intermediary based economies has an obligatory character, direct investment facilities provided by a liberalised capital market offer arbitrage opportunities and undermine this feature. A larger set of alternatives, that is, markets plus financial intermediaries, might not make individuals better off than intermediaries alone (Allan/Gale 1995: 190). Second, a long term orientation in the economic systems could decrease. Miles (1993) tested for short-termism in the UK stock market and found that profits expected five years after the start of an investment project are undervalued by 40 percent. In comparison, the interest rate spread between short and long term loans in Germany, often interpreted as a signal for an inefficient system (Horn 1994), looks rather small. The main corporate governance argument applied to this short or long term orientation is based on an approach that refers to implicit contracts. These allow stakeholders of a firm to form a long-term orientation. Hostile take-overs in a market based system of corporate control may disrupt these implicit contracts. Another explanation focuses on the finance options of firms. Dewatripont/Maskin (1995) argue that markets have difficulties in signalling the long-term orientation of an investment project. Therefore promising investment projects with low intermediate pay-outs but with intermediate finance needs are not funded because

the capital market pools them with less promising investment projects and endangers the refinancing in the intermediate state. Third, with fierce competition on liability side of banks (Wilson Committee 1980) and better refinancing conditions for large companies on the capital market, the typical cross-subsidisations for SMEs and the availability of long term finance to SMEs are reduced.

Many theoretical microeconomic studies on financial systems are based on a neo-institutional approach and focus on agency problems, asymmetric information and incentive effects. New institutional economics, the introduction of transaction costs and its incorporation into the theory of finance is a successful scientific programme, which explains a variety of existing institutions in developed market economies by their contribution to reducing the cost of controlling and enhancing contracts. It helps to assume that existing institutions must be efficient and reduce transaction costs, otherwise they would have perished in a competitive environment. However, the introduction of asymmetric information and incentive effects leads to stark deviations from assumptions and conclusions of basic neoclassic models (Alan/Gale 2000). And once asymmetric information and incentive effects are introduced, slight changes in the basic assumption can easily lead to opposite conclusions. In spite of some eclectic arguments the interaction of institutions is still puzzling (Herten/Hölscher 2000). Relevant differences of institutional factors and corporate governance may simply be complementary in financial systems (Vitols 1995, Schmidt/Hackethal/Tyrell 2001). It would therefore be useful if these were analysed simultaneously.

Attempts haven been made to integrate the theory of finance and macroeconomics (for example Bernanke/Gertler 1989, or Greenwald/Stiglitz 1993). Recently these approaches have been applied to financial systems by focussing on empirical macroeconomic research. Some authors highlight the role of long term and fixed interest liabilities, others the differences in the money, bank lending or balance sheet channel of public policies or differences in the wage bargaining process. These attempts appear so far as very arbitrary since they often select one specific institutional factor for their analysis. Macroeconomic fluctuations and the transmission and channels of monetary policy and exogenous shocks in different financial systems are, for example,

tackled in Devereux/Schiantarelli (1990), Borio (1995), Bockelmann (1996), Stöß (1996), Baran/Coudert/Mojon (1997), Chirinko (1997), Guender/Moersch (1997), Kashyap (1997), Elston (1998), Dornbush/Favero/Giavazzi (1998), Morley (1998), de Bondt (1999), Mojon (2000), Fountas/Papagapitos (2001) and Gambacorta (2003). To highlight some puzzling conclusions: Guender/Moersch do not find any indication of a credit channel in Germany despite a dominant role of bank finance in Germany and argue that this would be a consequence of relationship banking, although German type economies show a stronger relation between bank credit and investment whereas Anglo-American economies show a stronger relationship between investment and the stock market (Black/Moersch 1998). De Bondt (1999) finds that aggregate income and consumption in Germany is more sensitive to the valuation on the stock market, although market capitalisation in bank based economies tends to be much lower than in market based financial systems and Mankiw/Zeldes (1990) have shown that the consumption of stock holders is more volatile and is highly correlated with excess returns. Other works have highlighted that consumption plays a crucial part in the process that determines income and argued that the parameter is not constant over the business cycle in the UK and the US (Frowen/Karakitsos 1996, Arestis/Karakitsos 2003b). The consumption ratio appears to be pro-cyclical in the UK, whereas it is rather stable in Germany (Frowen/Karakitsos 1998). Allan and Gale (1995) also hint towards a stronger relation between share prices and consumption in the market based US system than in comparison to the bank based financial system in Germany.

Considering that coherent data for different countries is seldom available and that authors often refer to different data sets to back up their conclusions some puzzling differences may at least not be surprising. Furthermore, in the run-up to and first years of the European Monetary Union influential factors in different countries were related to interest rate changes and were hence hardly similar in some countries under investigation. A 'ceteris paribus' assumption cannot be applied. With regard to the UK, it cannot be applied either. Not joining EMU means that the exchange rate of the pound to the Euro still remains an important factor whose impact should be analysed simultaneously, which considerably complicates comparisons that are based on regression analysis. To put it in a general way, the causal link between finance,

economic activity and growth "is crucially determined by the nature and operation of the financial institutions and policies pursued in each country", so that cross country regression studies can hardly capture these differences (Arestis/Demetriades 1997: 785).

Studies on finance patterns in different financial systems have added a further puzzle. The analyses of net-flow and how finance means are channelled towards firms concludes that there are hardly any differences between the real world financial systems (Corbett/Jenkinson 1997, Mayer 1988). Internal finance is by far the dominant form in both market based and bank based financial systems. In fact a flow analysis shows that companies in the US and in the UK were net financier on the stock market during the 1980s. This suggests that profits or debt have been used to buy previously issued shares back instead of being used to invest. In other word, disinvestment took place with regard to the stock market. However, Hackethal/Schmidt (1999) analysed gross flows and concluded that these financing patterns in contrast to net flows mirror the structure of corporate governance in different financial systems.

1.2 AIMS AND OBJECTIVES

Existing differences of the institutional settings in both countries may on the one hand lead to distinctive macroeconomic fluctuation and require policies adopted to a given design of the financial system. In part, however, the institutional settings may be a result of different policy instruments and aims. Both sides of this relationship should be analysed. The purpose of the thesis is twofold. One aim is to apply the approach of traditional macroeconomic analysis to comparing financial systems and demonstrate its usefulness for this purpose, a second is aim is to analyse the private equity and venture capital industry in both countries and the implications of the recent rise in the funding activities by these financial intermediaries for the wider macroeconomic context.

In contrast to recent academic developments, which aim to integrate the latest findings made in the area of the Theory of Finance into macroeconomics, one aim of the thesis is to demonstrate the usefulness of traditional macroeconomic analysis. The traditional

analysis is applied to financial systems and the differences between market and bank based systems by focussing on the role of financial intermediaries in transforming the volatility of assets. In comparison the UK market based financial system Germany's bank based financial systems transforms a larger amount of volatile assets into fixed income assets for private households. The traditional analysis can also be applied by analysing the role of endogenous money and credit finance for autonomous demand, be it investment or consumption. A re-interpretation of the macroeconomic income multiplier, which equally permits autonomous consumption, adds a further theoretical aspect for analysing differences between financial systems. Both elements of the traditional analysis support the argument that the market based economic system of the UK is more consumption driven in comparison to the German bank based system.

Before turning to the second aim of analysing the private equity and venture capital market in both countries, a general form the macroeconomic income relationship is outlined here in order to illustrate the finance-macro-nexus. In contrast to empirical studies about the role of banks and markets, and in particular the quantitative contribution of bank finance, equity and internal finance to the funding of investment this short excursion uses a macroeconomic identity based analysis and sets out to explore the theoretical spectrum of how investment is funded.

Starting point of the formal analysis is the equality of aggregate demand and income distribution, whereby investment I is autonomous demand. W is wages, Q is profits, I is investment and C is consumption. Suffixes indicate consumption or savings of wage or profit recipients:

(1) $W + Q = I + C$

(2) $\Leftrightarrow Q = I + C - W$

(3) $\Leftrightarrow Q = I + C_Q - S_W$ with $C = C_Q + C_W$ and $W = C_W + S_W$

The classic view sees the causality differently and would rather interpret investment as independent variable:

(4) $$I = Q - C_Q + S_W$$

The following equation shows the income multiplier of autonomous investment in the general form and reduced form[1]:

(5) $$Y = \frac{I}{\frac{Q - C + W}{Y}} = \frac{I}{\frac{Q - C_Q + S_W}{Y}} = \frac{I}{\frac{S_Q + S_W}{Y}} = \frac{I}{s_Y}$$

In equilibrium profits Q are equal to the cost of capital. If investment was exclusively financed by external sources, profits would exactly cover the interest on capital, so that interest on loans and dividends on shares are covered. The capital coefficient of the economy is k, the interest rate on capital is r:

(6) $$r \cdot k \cdot Y = I + C - W = I + C_Q - S_W$$

An increase in autonomous demand may, however, not only incur quantity but also price effects, which causes Q-profits for firms (Keynes 1930):

(7) $$G_Q = I + C - W - r \cdot k \cdot Y = I + C_Q - S_W - r \cdot k \cdot Y > 0$$

Combining the multiplier of the General Theory with Q-Profits of the Treatise allows to split the effects of the multiplier into a quantity and price effect (Riese 1986: 48f). The price level is given by:

(8) $$P = \frac{Y_F}{y} + \frac{G_Q}{y}$$

Y_F is factor income. Since this chapter does not aim to analyse income inflation, the factor income can be set equal to real income. For $Y_F = y$ the price effect of a profit inflation is isolated:

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[1] Please note that the multiplier is of course the partial derivative of the dependant variable income to the independent variable autonomous demand in this equation and also in the following income equations.

(9) $$P_G = 1 + \frac{G_Q}{y}.$$

This is the index form. Entering this into $P_G = 1 + p_G$ for the relative change the result is:

(10) $$p_G = \frac{G_Q}{y}$$

With classic assumptions $C_Q = 0$ and $S_W = 0$ the quantity effect for autonomous investment becomes (Riese 1986: 50):

(11) $$y = \frac{I}{r \cdot k + p_G}$$ since $\frac{Q}{y} = r \cdot k$ represents the equilibrium profit ratio.

The price effect, in Keynes' terms coined profit inflation, reduces the quantity effect and changes the distribution of factor income. Although increases in productivity tamper the price effect, wage rises, in Keynes' terms coined income inflation, may follow to reinstate the original distribution of income, so that a cumulative inflation process begins.

So far autonomous investment is the crucial element of the process. It is fully autonomous and not reinforced by further investment spending from the additional factor income created. The following formal analysis treats consumption and investment in a similar way: consumption can be autonomous and investment may be reinforced by factor income created. This general form of the multiplier reveals a denominator that expresses the share of the factor income that is neither consumed nor invested. The amount of this 'non-demand' is denoted *ND* and shall express a distinction to previous Savings *S*. D^A is autonomous demand, either investment or consumption, which may be understood as being financed by credit 'ex nihilo':

(12) $$Y = \frac{D^A}{\frac{ND}{Y^F}}$$

Entering $ND = ND_Q + ND_W$ resolves in:

$$(13) \qquad Y = \frac{D^A}{\frac{ND_Q}{Y^F} + \frac{ND_W}{Y^F}}$$

This can be written in terms of 'non-demand' ratios for Q and W:

$$(14) \qquad Y = \frac{D^A}{nd_Q \cdot \frac{Q}{Y^F} + nd_W \cdot \frac{W}{Y^F}}$$

So far the identity based analysis distinguished between factor income from capital and labour. In order to be able to distinguish further between internal and external funding flows a more detailed analysis splits up the factor income from capital. Original profits at firms' level lead to further flows in form of consumption by capital owners or internally and externally funded investment; c_Q, if_Q and ef_Q reflect the respective ratio used for these purposes from original profits, we derive:

$$(15) \qquad Y = \frac{D^A}{(1 - c_Q - if_Q - ef_Q) \cdot \frac{Q}{Y^F} + nd_W \cdot \frac{W}{Y^F}}$$

This shows the income multiplier in the general form. The idea of Riese (1986) to split the traditional multiplier into a price and quantity effect can be applied to the general form of the multiplier. The price and profit effect is again:

$$(16) \qquad p_G = \frac{G_Q}{y}$$

Since $\frac{Q}{y} = r \cdot k$ represents the equilibrium profit ratio the quantity effect in a general form is:

$$(17) \qquad y = \frac{D^A}{(1 - c_Q - if_Q - ef_Q) \cdot (r \cdot k + p_G) + nd_W \cdot \frac{W}{y}}$$

An extreme theoretical case of a financial system in which the banking sector exclusively provides funding for consumption purposes is therefore conceivable. Autonomous consumption is funded 'ex nihilo'. Households take out loans, and these liabilities provide the productive sector indirectly with finance means, via internal or external finance. Investment may not be credit financed at all and external finance can theoretically depend entirely on private equity or share emissions, or even be fully neglected. The latter theoretical extreme case in which investment is exclusively based on internal finance would, on the basis of a flow analysis at least, reverse the evolution of capitalism, which is in general characterised by a separation of ownership and control. In the case that households solely depend on wage income it is likely that the liabilities created by autonomous consumption have to be backed by housing or other real assets.

Depending on the non-demand ratios in the denominator a small amount of autonomous demand, either for investment or for consumption, can induce a large increase of aggregate demand and income. With regard to the sustainability of autonomous consumption one aspect should be noted. Whereas investment flows create a capital stock that may generate future income, credit driven consumption merely creates liabilities for the consumers in the first instance and imbalances may build up. The growth rate of these liabilities cannot be consistently larger than the growth rate of the economy. A consumption boom based solely on mortgage equity take-outs or credit finance in expectation of rising equity prices can therefore not last indefinitely. If this additional demand is induced by a one-off structural adjustment of the economy, for example a general expectation of lower interest rates in the future due to institutional changes within the banking system, imbalances will not necessarily have to be corrected

but monetary and fiscal authorities may still find it difficult to engineer a smooth transition to other forms of demand when the expansionary impact of the autonomous credit financed consumption comes to an end.

Given the recent rise of the private equity and venture capital industry in many industrial countries, a second aim of the thesis is to analyse how this financial sector contributes to the funding of investment in the different institutional and political settings of the market based system in the UK and the bank based system in Germany, and how the growth of this industry impacts on the distinctive features of the existing financial system. On the one hand, private equity and venture capital companies are often perceived as market based actors, since they mainly seek a return on their initial investment via IPOs on the stock market. On the other hand they are financial intermediaries that provide intensive management advice and have inside knowledge of the investee company, which may struggle to raise funding on the capital market directly. The question arises whether the growth of this industry in Germany and the UK re-enforces or changes features of the existing financial systems. Although these financial intermediaries are in general supposed to depend only to a low degree on credit finance and to be reluctant to transform the volatility of assets for investors, which would suggest a tendency towards a more market based system, the final outcome depends on how these actors are embedded in the institutional framework of the financial system and on the design of specific policies implemented in both countries to promote this industry.

1.3 STRUCTURE OF THE WORK

The structure of the thesis is as follows. Based on the endogenous money approach in macroeconomics the following chapter 2 develops a discrete-time portfolio model that distinguishes between financial systems via the contribution that financial intermediaries make in transforming volatile assets. A two-asset, discrete-time portfolio model is used to analyse the macroeconomics of financial systems by applying the framework of Tobin-Brainhard type models of asset accumulation with outside money.

Financial intermediaries transform a volatile capital asset into a stable asset, named money, for households. Here it is endogenous and represents inside money. Its net-effect is not zero because the financial sector builds up and draws on reserves, which are not priced on any market, whereas households make portfolio decisions. Equity finance and not only credit finance can be understood as being created 'ex nihilo', depending on the transformation by the financial intermediaries. With a focus on the wealth effect of changing capital prices a comparative-static analysis explores whether aggregate income in market based financial economies is less or more sensitive to profit expectations than in bank based financial systems.

Chapter 3 discusses theoretical and empirical aspects of equity finance gaps. Recent developments about conceptual issues and definitions of funding gaps and the concepts of 'positive' and 'normative' equity gaps are elaborated. The latter are those that should be tackled by government policies. Subsequently, economic paradigms are applied to the equity finance gap and also related to regional economic theories. It then investigates the explanatory power of location quotients with regard to finance gaps and other empirical methods used to detect finance gaps. Whereas economic approaches have so far only tried to detect 'positive' equity gaps, the superiority of surveys, and hence self-investigations, in providing empirical data about 'normative' equity gaps is eventually discussed which provides the link to a survey based analysis of UK and German private equity and venture capital industry in the next chapter. Chapter 4 presents detailed survey results about the perception of equity funding gaps and of effective policy instruments in both countries, the differences between both countries are related to the distinctive institutional settings of a market based or bank based financial system.

The final chapter finally provides concluding remarks linking the micro- and macroeconomic issues of financial systems tackled in this thesis.

CHAPTER 2

MACROECONOMICS OF FINANCIAL SYSTEMS: A DISCRETE-TIME PORTFOLIO MODEL OF FINANCIAL INTERMEDIARIES AND MARKETS*

ABSTRACT

A two-asset, discrete-time portfolio model is used to analyse the macroeconomics of financial systems and to distinguish between so called bank (intermediary) and market based economies via a parameter for the transformation of assets by financial intermediaries. These institutions transform a volatile capital asset into a stable asset, named money, for households. It is endogenous and represents inside money. Its net-effect is not zero because the financial sector builds up and draws on reserves, which are not priced on any market, whereas households make portfolio decisions. In comparison to Tobin-Brainhard type models of asset accumulation with outside money the potential outcome of perverse results is considerably reduced. The comparative-static analysis shows that aggregate income in market based economies is less sensitive to profit expectations as long as the capital gain effect on consumption is not dominant. The aim of the chapter is fourfold. First, it argues, that Tobin only derived at Keynesian results, because he focussed his analyses on fiscal policy. These policies have, however, always a dominant effect in his models. Second, it argues that the design of models with endogenous money is superior. Third, limitations of previous Post Keynesian endogenous money approaches are overcome since the analyses incorporate portfolio decisions. Furthermore, equity finance and not only credit finance can be understood as being created 'ex nihilo', depending on the transformation by the financial intermediaries. Fourth, the model is applied to a comparison of financial systems.

JEL: E44, PS1, E12, G11, E20, B40

* *The equations of the models were presented at the thirtieth annual conference of the 'Money Macro and Finance' Research Group at The Management School, Imperial College, London, 9-11 September 1998 and at the inaugural conference 'Money, Investment and Risk' at The Nottingham Trent University, 3-6 June 1998. I would like to thank participants for useful hints.*

2.1 INTRODUCTION

The financial system of Anglo-American and German type economies are often described as market and bank (or intermediary) based. Yet, most of these studies refer to microeconomic arguments, recent developments in the theory of finance or empirical findings with regard to the financing of investment. They often highlight, how specific informational asymmetries are tackled within a different institutional design. Although the Neo-Keynesian approach seeks a micro foundation of macroeconomics the current Neo-Keynesian models have not been applied to a proper macroeconomic comparison of financial systems. From a macroeconomic point of view, it looks rather fruitful to start the analyses the other way around and to investigate the differences in the composition and distribution of assets and liabilities between households, banks, other intermediaries and firms. Whether they are a consequence of the institutional design of the economies or not, can be neglected in the first steps.

In this chapter a discrete-time portfolio model is developed which distinguishes between bank (intermediary based) and market based economies via the share of credit financed or intermediary transformed investment. The financial sector is assumed to build up or draw on (hidden) reserves (Alan/Gale 1995, Alan/Gale 2000). Money in the form of deposits is, as commonly understood, the reflex of bank lending, but it can also be the reflex of the investment by financial intermediaries, who transform assets in more stable assets for households. It represents endogenous inside money. In contrast to previous macroeconomic models with inside money this model explicitly incorporates the transformation function of financial intermediaries. In several papers Tobin had applied his 'New View" to different forms of banking regulation and their effect on the ability of commercial banks to create money. Long run effects of reserve requirements have been analysed in Romer (1985). The first part of the chapter demonstrates the

shortcomings of Brainhard's and Tobin's approach when the focus is on pure outside money as net wealth and on fiscal policies. In the following main part the focus shifts from outside to inside money. The comparative static analyses of potential outcomes demonstrates that under common assumptions with regard to investment, consumption and portfolio behaviour perverse results do not happen. The comparison between intermediary and market based economies finally shows that the former are more sensitive to profit expectations. In other words, Keynes' marginal efficiency of capital exerts a stronger influence on aggregate income.

2.2 TOBIN RECONSIDERED

Portfolio theory in the tradition of Brainhard and Tobin offers a general framework for macroeconomic and monetary analyses. Within these models asset and liability options can be chosen according to their importance in a specific country under investigation (Tobin 1969). Early portfolio models of the Brainhard and Tobin type were continuous-time models, which allowed a separation of portfolio and saving decisions. In other words, the flows, which represent additional stocks, were not incorporated into portfolio theoretic considerations. However, via the introduction of multiple discount rates according to the number of assets under investigation, these models are superior to the simplified Keynesian IS/LM-model, which focuses exclusively on monetary interest rates. In an elaborated portfolio-model a link between the interest rate on money, or government bonds, and the discount rate relevant for investment still exists, more indirectly though, and has to be established through postulated assumptions with regard to the portfolio behaviour of households. The shortcoming of the IS/LM model in which the long-term government bond rate is equated with the discount rate on capital investment is overcome. The general framework with the possibility to introduce a menu of relevant assets clarified many controversial issues of macroeconomics. A simple version in form of a two asset, money-capital model, can still be expressed within the standard IS/LM terms, the difference is that the vertical is the required return on capital equity by the financial markets and not the long-term government bond rate (Brainhard/Tobin 1977). The crucial factor for investment in these models is the relation

between the demand and supply price of capital. The ratio of both, called q, would determine investment behaviour. Tobin refers to Keynes (Tobin 1978: 4):

> "... The daily revaluations of the Stock Exchange, though they are primarily made to facilitate transfer of old investments between one individual and another, inevitable exert a decisive influence on the rate of current investment. For there is no sense in building up a new enterprise at a cost greater than that at which a similar existing enterprise can be purchased; whilst there is an inducement to spend on a new project what may seem an extravagant sum, if it can be floated off on the Stock Exchange at an immediate profit." [Keynes 1936]

Another criticism of the IS-LM model was that it conflates stocks and flows. Yet flows change stocks as Keynes' description of investment as an arbitrage process and of the link between the primary and secondary equity market stresses. Tobin neglected this link in his earlier models, which were, as the IS/LM-model, continuous-time models. Savings and portfolio decisions can be separated in these models. The former is typically not analysed, although the investment process must in the end lead to the ex post similarity of Saving and Investment via output. This is the autonomous investment assumption which reverses the causal link between saving and investment. The crucial question hereby is not how investment is financed in an ex ante sense but in which form created capital assets are held by the public and the transformation of these assets by financial intermediaries as a kind of ex post financing.[1]

In the late seventies Tobin presented some discrete-time models, in which asset accumulation is explicitly analysed. Savings add to financial asset, investment adds to the capital stock and also the government deficit has to be financed, either by printing money or through the emission of government bonds[2]. In contrast to the monetarist view of a full crowding out of fiscal policy, he intended to demonstrate that even with regard to the government budget equation a full crowding out only happens under very

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[1] For a further discussion see chapter 1 and the remarks on disequilibrium stages with internal profits for the financing of investment.

[2] For a general discussion of this approach see Tobin (1980), Portfolio Choice and Asset Accumulation. For an application to fiscal policy see Tobin (1979), Deficit Spending and Crowding Out in Shorter and Longer Run, as well as the extended analysis in Tobin/Buiter (1980), Fiscal and Monetary Policies, Capital Formation and Economic Activity.

restrictive and special conditions. However, his focus on fiscal policy avoids a problem which arises when rising profit expectations alone change the valuation of equity. It can be traced back to "Pitfalls of Financial Model Building", in which Brainhard and Tobin (1968) mention, that capital gains might later be realised. But this would in turn include declining equity prices and hence a declining q with negative effects on investment. Consequently, the reallocation of capital gains is the only item not shown in a table showing all other possible effects of their dynamic simulation. These effects can, however, be demonstrated quite clearly in discrete-time model.

2.3 THE OUTSIDE MONEY-CAPITAL MODEL

The following model describes the restrictive conditions under which rising profit expectation are expansionary and lead to investment in a discrete-time model of the Tobin type (Tobin 1979). To avoid the effects of fiscal policy in this model it shall be assumed that there is no government deficit, but a given amount of outside money. The model is a simple money-capital model and illustrated by the following balance sheets:

Firms

Real Assets	$K_{Households}$

Households

K_{Firms}	Net Wealth
$M_{Government}$	

Government	
?!	$M_{Households}$

There are two endogenous variables, the interest rate on capital r_K and income Y which take only one value within the period[1]. The exogenous variables are the expected future profits R and Money M. The amount of outside-money is given because a variation would express the financing of the fiscal deficit with high powered money. The price level is given so that the values can be interpreted as nominal and real values simultaneously.

In this case the accounting identities and saving functions of Tobin (1979) are reduced to:

(1) $Y = C + I = C + S$

(2) $S = I = q_K \cdot \Delta K$

(3) $S(...) = F^K(...) - \Delta q_K \cdot K_{-1} + F^M(...)$

C is private expenditure on goods and services. S saving, ΔK is the change in the capital stock for this period, q_K is the value of one capital unit. Equation (3) expresses a definition of saving as asset accumulation. Saving and in addition capital gain or loss on the initial holdings change the public wealth. Each function $F(...)$ expresses the decision of wealthowners to hold values of either asset, K or M, at the end of the period. It is a function of within-period variables. The endogenous variables are r_K and Y. K_{-1} is the capital stock at the beginning of the period. The exogenous variable is Keynes' marginal efficiency of capital R. Investment depends on Tobin's q:

(4) $I = \theta(q)$ with $\theta'(q) > 0$

[1] For an overview of the symbols used refer to the end of this chapter, where the notation is explained.

which in turn is function of R and r_K:

(5) $q = R / r_K$

This results into two equations for accumulation in the two assets:

(6) IK: $F^K(...) - \Delta q_K \cdot K_{-1} - \theta(q) \cdot K_{-1} = 0$

(7) IM: $\underbrace{F^M(...)}_{S} \quad \underbrace{\qquad}_{I} = 0$

Note that the capital gain may make $S_R < 0$ even if $F_R^K + F_R^M \geq 0$. The marginal propensity to save in traditional terms and in terms of asset accumulation is identical if the capital gain term is independent of Y: $S_Y = F_Y^K + F_Y^M$.

We derive partial derivatives in matrix form:

(8) $$\begin{bmatrix} F_{r_K}^K - q_{r_K} \cdot K_{-1} - \theta' \cdot q_{r_K} \cdot K_{-1} & F_Y^K \\ F_{r_K}^M & F_Y^M \end{bmatrix} \begin{bmatrix} \partial r_K / \partial R \\ \partial Y / \partial R \end{bmatrix} = - \begin{bmatrix} -q_R \cdot K_{-1} - \theta' \cdot q_R \cdot K_{-1} \\ 0 \end{bmatrix}$$

Under common assumptions with regard to the demand for money F_Y^M is positive and the sign pattern of the Jacobian is $\begin{bmatrix} + & +/- \\ +/- & + \end{bmatrix}$. The determinant is:

$$|\mathbf{J}| = F_Y^M \cdot \underbrace{(F_{r_K}^K - q_{r_K} \cdot K_{-1} - \theta' \cdot q_{r_K} \cdot K_{-1})}_{+} - \underbrace{F_Y^K \cdot F_{r_K}^M}_{+}$$

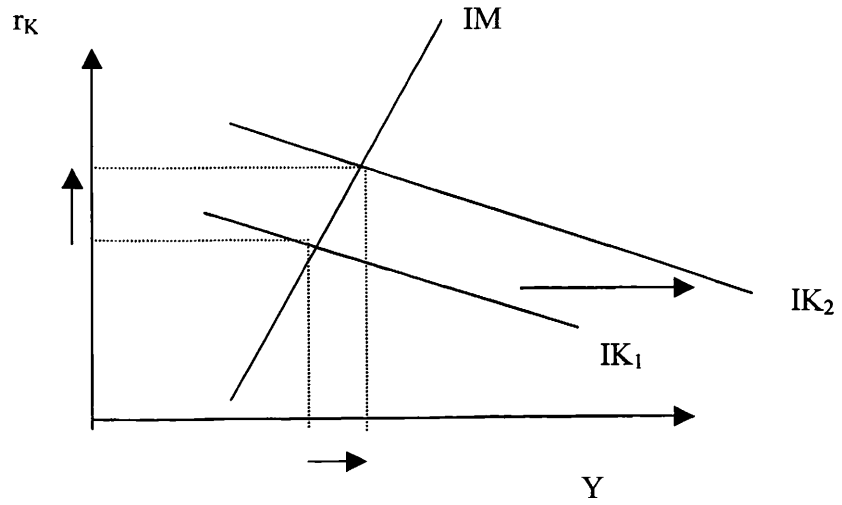
(9) $$\partial Y / \partial R = \begin{bmatrix} F_{r_K}^K - q_{r_K} \cdot K_{-1} - \theta' \cdot q_{r_K} \cdot K_{-1} & q_{r_K} \cdot K_{-1} + \theta' \cdot q_{r_K} \cdot K_{-1} \\ F_{r_K}^M & 0 \end{bmatrix} / |\mathbf{J}|$$

$$= \frac{-F_{r_K}^M \cdot (q_R \cdot K_{-1} + \theta' \cdot q_R \cdot K_{-1})}{F_Y^M \cdot (F_{r_K}^K - q_{r_K} \cdot K_{-1} - \theta' \cdot q_{r_K} \cdot K_{-1}) - F_Y^K \cdot F_{r_K}^M}$$

This result is illustrated by the following graphs. IK and IM represent a equilibrium combinations (r_K, Y) of asset accumulation in the specific asset. Case a) can be considered as normal case as IK is downward and IM is upward sloping. An increase in *R* leads to an outward shift of IK.

Diagram 2.1: Case a) Outside Money-Capital Model

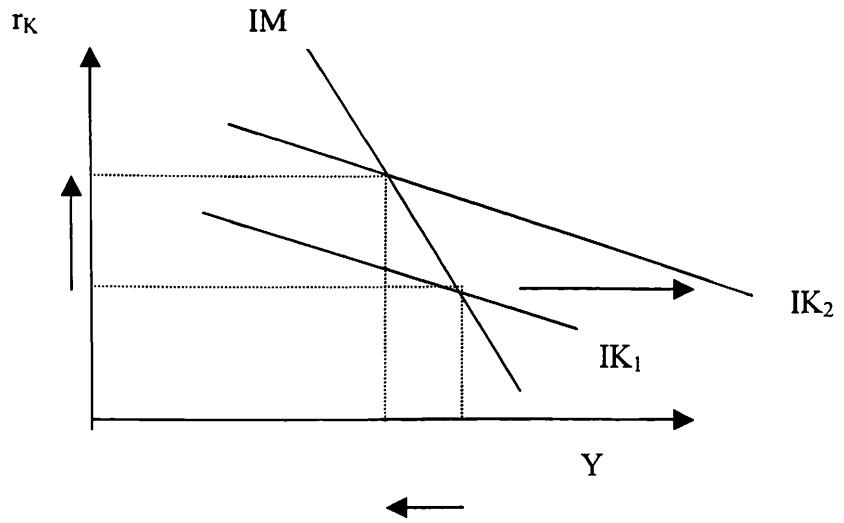
$$\partial Y / \partial R > 0 \text{ if } F^M_{r_K} < 0 \text{ and } |\mathbf{J}| > 0 \quad \text{(wealth increases)}$$



The slope of the IM curve is $\partial r_k / \partial Y = -F^M_Y / F^M_{r_K}$ and the slope of the IK curve given by $\partial r_k / \partial Y = -\dfrac{F^K_Y}{F^K_{r_K} - q_{r_K} \cdot K_{-1} - \theta' \cdot q_{r_K} \cdot K_{-1}}$ (implicit function theorem).

Diagram 2.2: Case b) Outside Money-Capital Model

$\partial Y / \partial R \leq 0$ if $F_{r_K}^M \geq 0$ and $|\mathbf{J}| > 0$ (wealth declines)

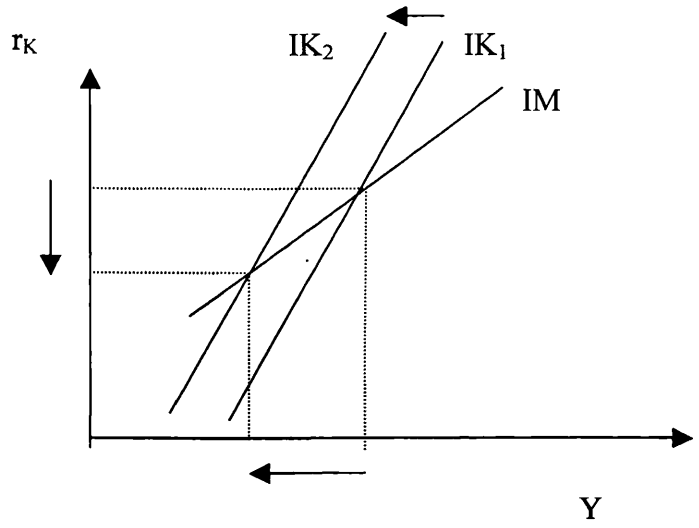


The second case can be considered as the monetarist case as discussed in Tobin (1979). The wealth effect dominates the substitution effect: A higher interest rate leads to additional saving but some of it goes into money. Despite a higher profit expectations R, Tobin's q might stay constant or even decline with negative effects on investment and income.

There is a third case for which the result is negative. An increase in R leads to an inward/upward shift of a positively sloped IK curve if F_Y^K is negative. The denominator of the general results refers to the slope of the curves. Its sign pattern depends on their relative slope to each other. If both, IK and IM, have positive slopes but IM is flatter, the result for $\partial Y / \partial R$ will also be negative even though $F_{r_K}^M$ is negative.

Diagram 2.3: Case c) Outside Money-Capital Model

$$\partial Y / \partial R \leq 0 \text{ if } F_{r_K}^{M} \leq 0 \text{ and } |\mathbf{J}| < 0$$



Tobin developed discrete-time models to demonstrate how restrictive the conditions are at which monetarist conclusions regarding fiscal policy apply. We can now more generally remark that these are effectively the same conditions which also lead to perverse results of rising profit expectations in these models. As a result Tobin's analyses of deficit spending can hardly be called a study on the potential of a full crowding out as such. Without being mentioned it was rather an analyses on the features of the basic model and assumptions. His kind of deficit spending is unambigous and has always positive effects as long as the model does not show perverse results. However, the real problem lays deeper. There are two ways out of this dilemma. One line of reasoning could argue that the monetarist assumption are really restrictive and unrealistic, so that perverse results can hardly happen. More pronounced: As perverse results do not happen these monetarist assumptions have to be unrealistic. The other line would argue that models with such a structure suffer a fundamental shortcoming if such perverse results may occur even though the conditions for this to happen are slightly restrictive. Especially from a Keynesian point of view, models in which rising profit expectations are not sufficient for an investment and income expansion look at least odd.

2.4 THE INSIDE MONEY-CAPITAL MODEL

In the following Tobin's model is modified. The focus on money as state deficit and net wealth is changed. Investment can partly be financed by money creation. Banks and other financial intermediaries build up or draw on hidden reserves, which are not correctly and immediately valued on the capital market (Allan/Gale 1995, Allan/Gale 2000). In other words, there is no Walrasian auctioneer for these assets. The model abstracts therefore from bank equity as the following balance sheets show:

Firms

Real Assets	$IK_{Intermediaries}$
	$K_{Households}$

Intermediaries

	$M_{Households}$
K_{Firms}	
	Hidden Reserves

Households

K_{Firms}	
	Net Wealth
$IM_{Intermediaries}$	

The consolidated balance sheet of firms and intermediaries is:

Firms + Intermediaries	
Real Assets	$K_{Households}$
	$M_{Households}$
	Hidden Reserves

To return to Keynes' citation, the inducement to spend on new investment projects is typically not financed by the emission of new equity alone, it rather financed by other means, internal or external finance. The traditional credit view described a monetary economy as one in which credit and money can be created ex nihilo (Wicksell 1898, Trautwein 1997). Investment can then be understood as an arbitrage process of the productive units, which takes some time and may later lead to a flotation of the new investment on the stock market. The valuation on the stock market is therefore rather a necessary condition for investment. However this line of reasoning came out of fashion after the discussion on inside and outside money and the Modigliani/Miller theorem on the irrelevance of financial structure.

The difference between a bank and market based financial system is seen in the share of investment financed through intermediaries γ_M which simultaneously creates additional liabilities or Money *M*. In a market based system the share of bank-credit financed investment is usually lower. The reasons might be found in an arm-length relationship between banks and firms, the availability of long-term bank credit for investment or a comparative advantage of banking via subsidies, taxation and regulation in the bank based system. During the development of the financial system the comparative advantage of banking might, however, diminish, when capital markets become more liquid and deep (Renversez 1996).

The accounting identities and saving functions are as follows:

(10) $Y = C + I = C + S$

(11) $$S = I \Leftrightarrow \gamma_K \cdot q_K \cdot \Delta K + \Delta M = q_K \cdot \Delta K = \frac{1}{\gamma_M} \cdot \Delta M$$

(12) $$S(...) = F^K(...) - \gamma_K \cdot \Delta q_K \cdot K_{-1} + F^M(...)$$

Note in equation (11) the similarity to the traditional credit view $I = S + \Delta M$. The important difference in this model is that ΔM is part of the saving and also the portfolio decision of households. In an equilibrium it is part of the public portfolio and it is not additional to saving in capital assets but replaces partly the need for saving in capital assets for the public due to the transformation of assets by financial intermediaries. In this sense the model is in line with the 'New View'. The 'widow's cruse' or the ability of commercial banks and financial intermediaries to create money is somewhat limited (Tobin 1963). Equation (12) expresses again a definition of saving as asset accumulation. Created money is part of the end-of-period portfolio decision and hence 'ex post' deliberately held. Otherwise, price effects and inflationary pressure, which are not analysed in this basic model, are likely to occur. Please note again that the capital gain, which here depends on the share of volatile assets held by the public γ_K, may make $S_R < 0$ even if $F_R^K + F_R^M \geq 0$. Finally, please note that these functions in this model only represent asset accumulation and saving of the households. Due to the transformation of assets by financial intermediaries, aggregate asset accumulation is likely to differ. According to the model a change in the valuation of capital in comparison to the previous period would be the necessary condition for this to happen. If q was not a simple within-period-variable a difference between aggregate and household's saving and investment would also occur.

Asset accumulation is expressed in both assets and according to the share of their contribution to investment financing through the following equations:

(13) IK: $$F^K(...) - \gamma_K \cdot \Delta q_K \cdot K_{-1} - \gamma_K \cdot \theta(q) \cdot K_{-1} = 0$$

(14) IM: $$\underbrace{F^M(...)}_{S} \underbrace{- \gamma_M \cdot \theta(q) \cdot K_{-1}}_{I} = 0$$

with $\gamma_K = 1 - \gamma_M$ and $0 \leq \gamma_M, \gamma_K \leq 1$

For reasons of simplicity we hereby imply that the parameter $\gamma_M = 1 - \gamma_K$ is stable over time so that it describes new investment and accumulated stocks.

We derive partial derivatives in matrix form:

$$(15) \quad \begin{bmatrix} IK_{r_K} & F_Y^K \\ IM_{r_K} & F_Y^M \end{bmatrix} \begin{bmatrix} \partial r_K / \partial R \\ \partial Y / \partial R \end{bmatrix} = - \begin{bmatrix} IK_R \\ IM_R \end{bmatrix} \Leftrightarrow$$

(16)

$$\begin{bmatrix} F_{r_K}^K - \gamma_K \cdot q_{r_K} \cdot K_{-1} - \gamma_K \cdot \theta' \cdot q_{r_K} \cdot K_{-1} & F_Y^K \\ F_{r_K}^M - \gamma_M \cdot \theta' \cdot q_{r_K} \cdot K_{-1} & F_Y^M \end{bmatrix} \begin{bmatrix} \partial r_K / \partial R \\ \partial Y / \partial R \end{bmatrix} = - \begin{bmatrix} -\gamma_K \cdot q_R \cdot K_{-1} - \gamma_K \cdot \theta' \cdot q_R \cdot K_{-1} \\ -\gamma_M \cdot \theta' \cdot q_R \cdot K_{-1} \end{bmatrix}$$

$$(17) \quad \partial Y / \partial R = \frac{-IK_{r_K} \cdot IM_R + IM_{r_K} \cdot IK_R}{IK_{r_K} \cdot F_Y^M - F_Y^K \cdot IM_{r_K}}$$

This is positive if both nominator and denominator are positive:

$$\begin{aligned} & \partial Y / \partial R > 0 \\ (18) \quad \Leftarrow \quad & -IK_{r_K} \cdot IM_R + IM_{r_K} \cdot IK_R > 0 \ \wedge \ IK_{r_K} \cdot F_Y^M - F_Y^K \cdot IM_{r_K} > 0 \end{aligned}$$

Entering the derivative functions of (16) and dividing by $F_{r_K}^K$ and F_Y^M (assuming that $F_{r_K}^K > 0$ and $F_Y^M > 0$) we rearrange the second condition in (18) for the denominator:

$$(19) \quad 1 - \gamma_K \cdot \frac{(1+\theta') \cdot q_{r_K} \cdot K_{-1}}{F_{r_K}^K} > \frac{F_Y^K}{F_Y^M} \cdot \frac{F_{r_K}^M}{F_{r_K}^K} + \gamma_M \cdot \frac{\theta' \cdot q_{r_K} \cdot K_{-1}}{F_{r_K}^K}$$

For $\frac{F_Y^K}{F_Y^M} \cdot \frac{F_{r_K}^M}{F_{r_K}^K} < 1$, of which the components represent standard macroeconomic assumptions and simply state that an increase in the interest on capital has a relative advantage in absorbing capital and an increase in income in absorbing money, the

denominator is always positive. The left side of the inequality is also always positive. Entering the maximum value for $\frac{F_Y^K}{F_Y^M} \cdot \frac{F_{r_K}^M}{F_{r_K}^K} = 1$ into (19) we derive:

(20) $\gamma_M < 1 + \theta' \Rightarrow \gamma_M \leq 1.$

After multiplication of the terms and division by $q_R \cdot K_{-1}$ and $q_{r_K} \cdot K_{-1}$ the first condition in (18) for the nominator is transformed into:

(21) $$-\gamma_M \cdot \theta' \cdot F_{r_K}^K + (1-\gamma_M) \cdot (1+\theta') \cdot F_{r_K}^M < 0$$

(22) $$\Leftrightarrow \quad \frac{F_{r_K}^M}{F_{r_K}^K} < \frac{\gamma_M}{(1-\gamma_M)} \cdot \frac{\theta'}{(1+\theta')} \qquad \text{for } \gamma_M > 0$$

$$F_{r_K}^M < 0 \qquad \text{for } \gamma_M = 0$$

(22) is always fulfilled if $F_{r_K}^M < 0$. However, for $\gamma_M > 0$ the condition is also fulfilled for a positive range of $F_{r_K}^M$, which increases with γ_M. This is the main difference to the former Tobin type model for which $\gamma_M = 0$. Allegorically speaking the relative advantage of absorbing capital for an increase in its interest rate must be larger than the separated effect of increased profit expectations on the ratio of additional assets that have to be hold due to new investment and the increased value of the capital stock. An illustration of the relationship is given by a transformation of (22) for $F_{r_K}^M > 0$:

(23) $$\frac{F_{r_K}^K}{F_{r_K}^M} > \frac{IK_R}{IM_R} \quad \text{for } \gamma_M > 0$$

Another relationship may make the structure of the model more transparent: Which conditions have to be fulfilled so that there is no change in the interest on capital despite changing profit expectations? The interest rate would not respond, if the relative advantage of absorbing money for an increase in income is exactly the same as the ratio of assets that have to be hold additionally due to increased profit expectations:

$$\partial r_k / \partial R = 0 \Leftrightarrow \frac{F_Y^K}{F_Y^M} = \frac{IK_R}{IM_R}$$

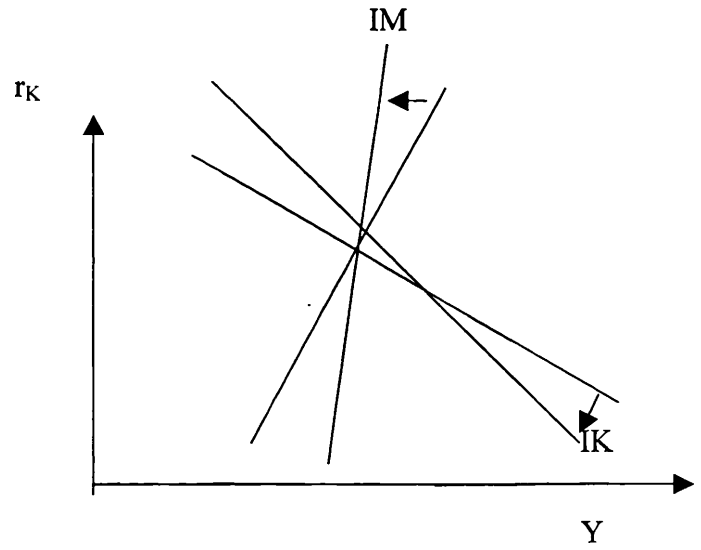
We can now summarize:

$$\partial Y / \partial R > 0$$

$$\text{for } \frac{F_{r_K}^M}{F_{r_K}^K} < \frac{\gamma_M}{(1-\gamma_M)} \cdot \frac{\theta'}{(1+\theta')}, \ \frac{F_Y^K}{F_Y^M} \cdot \frac{F_{r_K}^M}{F_{r_K}^K} < 1, \ F_{r_K}^K > 0 \text{ and } F_Y^M > 0$$

The graphical interpretation shows that IM pivots to the left and that IK will be less flat if financial intermediaries transform assets.

Diagram 2.4: Inside Money leads to a Pivoting of the Curves



Secondly, an increase in R shifts both curves to the right[1]. In comparison with the outside money model this further ensures a positive result. The relative amount of the

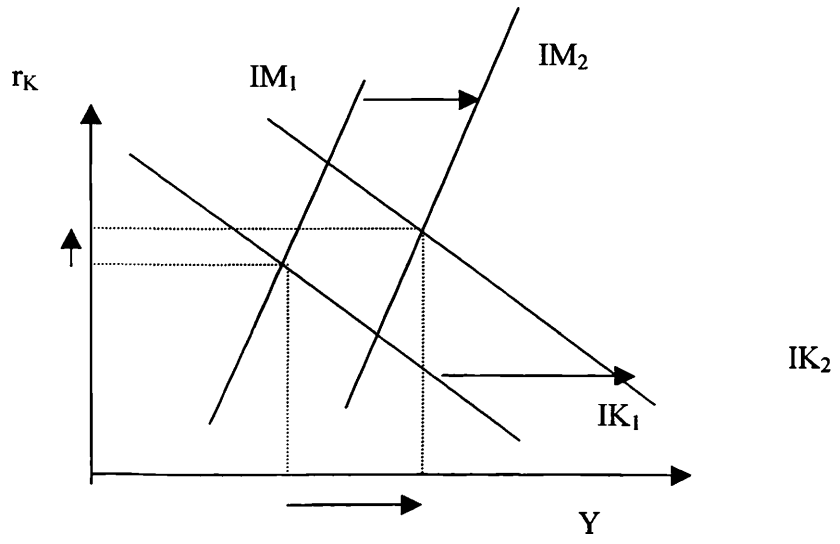
[1] From a technical point of model construction this effect is similar to an increase of the external parameter bank reserves in the credit channel model of Bernanke/Blinder (1988), which shifts both CC (former IS) and the LM curve outwards. Economically, investment increases the supply of the capital and simultaneously of the money asset. An increase in the external parameter is also in general more expansionary (see part 5).

shifts depends on the share of finance and whether a change in income relatively absorbs more money or capital. The change in r_K is ambiguous depending on the relative shift of both curves.

$$|\mathbf{J}| > 0$$

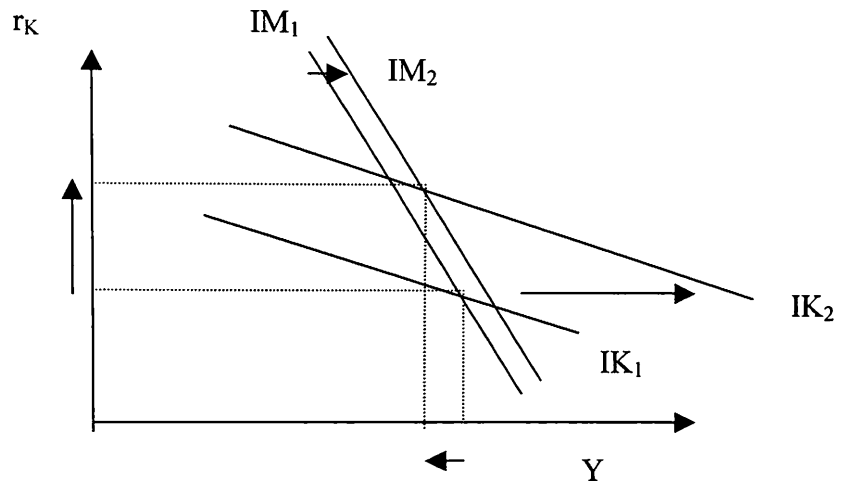
$$F_Y^M / F_Y^K > \frac{F_{r_K}^M - \gamma_M \cdot \theta \cdot q_{r_K} \cdot K_{-1}}{F_{r_K}^K - q_{r_K} \cdot K_{-1} - \gamma_K \cdot \theta \cdot q_{r_K} \cdot K_{-1}}$$

Diagram 2.5: Inside Money, Profit Expectations and the Shift of both Curves



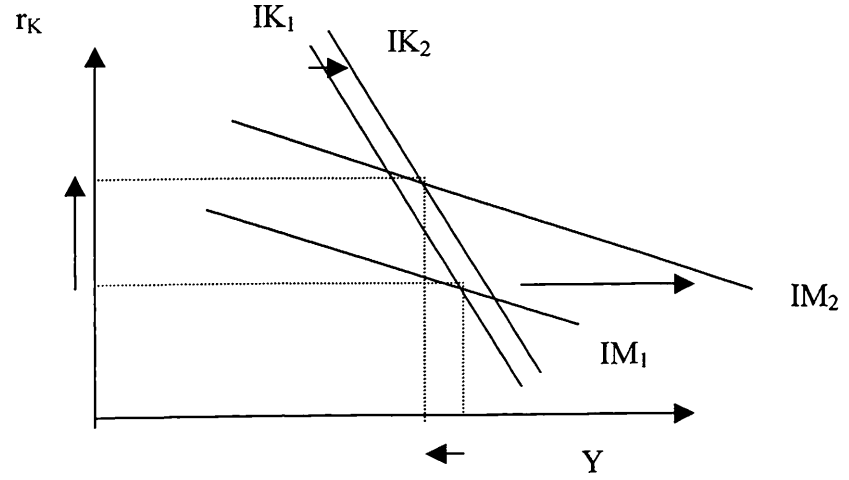
The extreme case of a negative outcome is illustrated in diagram 2.6. It shows a situation in which IM has a negative slope and shifts only slightly to the right with an increase in R. IK shifts further upwards than IM:

Diagram 2.6: Inside Money and the First Extreme Case



To complete the story there is one even more extreme case left. In which both curves have a negative slope, but in this case IM is flatter and IM shifts further upwards than IK (F_{rk} very strong).

Diagram 2.7: Inside Money and the Second Extreme Case



2.5 BANK AND MARKET BASED ECONOMIES WITH INSIDE MONEY

The previous analyses have shown that perverse results are less likely with financial intermediation. A further question is, whether increased profit expectations are always more expansionary in a system with a higher degree of intermediation:

$$(26) \qquad \partial Y / \partial R'(\gamma_M) > 0 \Leftrightarrow F^M_{r_K} > -\frac{\theta'}{1+\theta'} \cdot F^K_{r_K} + \theta' \cdot q_{r_K} \cdot K_{-1} \qquad \text{for } \partial Y / \partial R(\gamma_M) > 0$$

Equation (26) is the main final result of this chapter. A bank based system is more sensitive to profit expectations, or in Keynesian terms, to the marginal efficiency of capital. Only in the extreme case that an increase in the interest rate on capital has a stronger effect on dis-saving in the money asset than on the volume of investment the result may be the opposite. A larger degree of intermediation would, however, hamper the relative increase of the interest rate. Overall, consumption has to dominate investment in this case. Graphically, the IM curve is nearly horizontal, the positive effect of the larger outward shift is dominated by inward pivoting of the curve.

The overall result for the degree of intermediation consists of two effects. One is the capital gain effect on consumption. This positive effect for aggregate income is smaller in systems with a higher degree of intermediation since public wealth increases less, but the second effect on the interest rate on capital, that investment creates additional assets including the money assets, which is also sought as income increases, is larger. Splitting both effects and arguing that consumption might adopt faster, the dynamic movement might also be different: Market based systems react faster but not stronger, which is also a result of empirical studies. Finally and somewhat contrary to this view, Allan and Gale (1995) argue that the oil price shock in the seventies had a lower negative impact on income in bank based systems because the financial intermediaries smoothed consumption. However, they fully neglect the role of investment, the other part of aggregate demand. At first glance decreased profit expectations should have a stronger effect on income in bank based systems according to the above model, yet, in a deep crises, when investment becomes rather tiny, the result depends mainly on the capital

gain effect on consumption, which has a larger negative impact in market based systems. Hence, in this specific case the findings of Allan and Gale are similar to the model presented here.

The above analyses so far implicitly assumed that the behaviour of households is identical despite different financial systems. However, a reasonable criticism could be, that households partly adopt to the system they live in, so that the differences in their responses to the systems are not as pronounced as described above. In an extreme case of structural neutrality flows are treated exactly similar to accumulated stocks and the asset accumulation behaviour of households with regard to income and interest rate changes is proportionate to the degree of intermediation. The response of either financial system to exogenous shocks with regard to income and interest rates then show similar effects. In a world with more than two assets, structural homogeneity would also imply that an increase in income leads to an automatic proportionate increase of all other assets including for example state bonds as a reflex of deficit spending. For a higher degree of substitution between inside and given outside money than towards real assets, inside money created partly replaces outside money in the case of an income expansion.

2.6 CONCLUSION

In this chapter a discrete-time portfolio model was developed which distinguished between bank (intermediary based) and market based economies via the share of credit financed or intermediary transformed investment. The financial sector is assumed to build up or draw on (hidden) reserves. Money is, as commonly understood, the reflex of bank lending, but it can also be the reflex of the investment by financial intermediaries who transform assets in more stable assets for households. It represents endogenous inside money. The chapter demonstrated the shortcomings of Brainhard's and Tobin's approach when the focus is on pure outside money as net wealth and on fiscal policies. In the following part the focus shifted from outside to inside money, whereby financial intermediaries build up and draw on reserves. The comparative static analyses of

potential outcomes demonstrated that under common assumptions with regard to investment, consumption and portfolio behaviour perverse results do not happen. The comparison between intermediary and market based economies finally showed that the former are more sensitive to profit expectations, in other words, Keynes' marginal efficiency of capital, exerts a stronger influence on aggregate income. Since this is only the case when the capital gain effect on consumption is not dominant and furthermore since it could be argued that consumption adopts faster than investment, future research might aim to develop a dynamic version of the model. Further potential extensions look also promising. These would obviously include the introduction of policy variables. Another extension could integrate the stock of reserves, their changes in value and the consequences for the stability of intermediary based systems. Finally, an important question is also, whether the parameter, that reflects the transformation by financial intermediaries, is stable over the short term of the business cycle. All of these extensions would certainly render the mathematics of this basic model presented in this chapter more complicated.

NOTATION

r_K =	interest rate on capital
r_M =	interest rate on money
q_K =	value of one capital unit
S =	aggregate saving of households
I =	aggregate investment
Y =	aggregate income
C =	aggregate consumption
K =	capital stock
K_{-1} =	capital stock at the beginning of the period
q =	Tobin´s (and Brainhard's) q
Q =	windfall profits
$F^K(...)$ =	end-of-period portfolio decision with regard to capital asset
$F^M(...)$ =	end-of-period portfolio decision with regard to money asset
$\theta(...)$ =	investment function as a percentage of the capital stock
θ' =	partial derivative of the investment function for q
R =	expected profits, marginal efficiency of capital
γ_M =	share of bank-credit (intermediary) financed investment
γ_K =	share of capital financed investment
J =	Jacobian Matrix

CHAPTER 3

CONCEPTUAL AND EMPIRICAL ISSUES OF EQUITY FINANCE GAPS

ABSTRACT

This chapter discusses theoretical and empirical aspects of equity finance gaps. Recent developments about conceptual issues and definitions of funding gaps and the concepts of 'positive' and 'normative' equity gaps are elaborated. Subsequently, economic paradigms are applied to the equity finance gap and also related to regional economic theories. Since the explanatory power of location quotients with regard to finance gaps is very limited the chapter investigates other empirical methods used to detect finance gaps. Surveys, and hence self-investigations, can provide information about 'normative' equity gaps, whereas economic approaches have so far only tried to detect 'positive' equity gaps.

JEL: G24, G28, R12

3.1 INTRODUCTION

Due to the vagueness of the term 'gap' it is hardly surprising that its discussion is diffuse and does not concentrate on a specific issue. A common assumption in the discussion of equity gaps is, however, the idea that in some specific market segments – whether particular deal sizes, types of firms, maturities of finance, stages of firm development, economic sectors, or specific regions – the quantity of capital supplied is for one reason or another insufficient relative to the demand. In other words the realized market outcome in a segment is lower than expected und could be increased if the supply of equity capital was not hampered by some factors.

Policies to fill a finance 'gap' are confronted with two interrelated problems. First, the concept of a 'funding gap' is vague and controversial. Different authors present diverging definitions and arrive at opposite conclusions. Second, even with a precise definition the empirical measurement of funding gaps remains equally problematic.

The research leading aims of this chapter are four-fold:

1. To examine the state of the art in economics with regard to the definitions of equity gaps and to present an elaborated version of these definitions
2. To apply general economic paradigms to the equity finance gap and also relate them to regional economic theories
3. To analyse the explanatory power of location quotients with regard to finance gaps
4. To assess empirical methods used to detect finance gaps

3.2 CONCEPTUAL ISSUES: WHAT IS A 'GAP'

Different authors highlight different aspects of finance gaps. Lonsdale (1997) provides an extensive historic overview on the political discussion in the UK and for example defines the UK equity gap as "the shortage in the availability of equity capital in

amounts of less than £ 400.000 to businesses with a reasonable prospect of profitability" (Lonsdale 1997: 4). Virtanen (1996: 43) would detect a finance gap, if there is some form of price discrimination. Either marginal return on investment exceeds the marginal cost of capital due to discontinuities in the supply to some firms so that investment does not take place at all, or these firms suffer from a form of price discrimination. Affected firms incur a higher cost of finance even if this is adjusted for differentials in risk and administration cost. Norton (2001: 241) analyses the market activity across risk and return combinations. Companies that have a default rate above 2% do not receive loans from banks, in the case that these companies also have an expected return rate below 20 percent they are not a target for the venture capital industry or IPOs, so that they suffer from a finance lack in the 'gap' area. For the UK context Cruikshank (2000: chapter 6) argues that "there is clearly a mismatch between the needs of firms requesting small scale equity investments and the supply of these investments. Venture capital deals tend to be too large and business angel finance is underdeveloped. This gives rise to the long recognized market failure known as the equity gap."

The questions where the gap stems from and which finance needs should actually be fulfilled are still not answered, however, in a neoclassical world of perfectly competitive capital markets, costless and perfect information and complete contracting, there would be no market failure. All resources of the economy would be fully employed and individual preferences of investors would not matter because the market value of a company would always be the sum of all claims on its assets due to the market's ability to provide the required split of assets and liabilities without any cost. In this case the financial structure of a company becomes irrelevant for its market value (Modigliani/Miller 1958). Persistent gaps, or 'mismatches' to use Cruickshank's phrase, imply an equilibrium situation in which the volume of investment in a particular segment of the economy is below that which would emerge in a perfectly competitive market.

A symposium published in the Economic Journal tried to clarify the issue using arguments based on economic theory; the articles of contributors and aspects involved demonstrate that the concept of a funding gap is a complex issue. Cressy (2002)

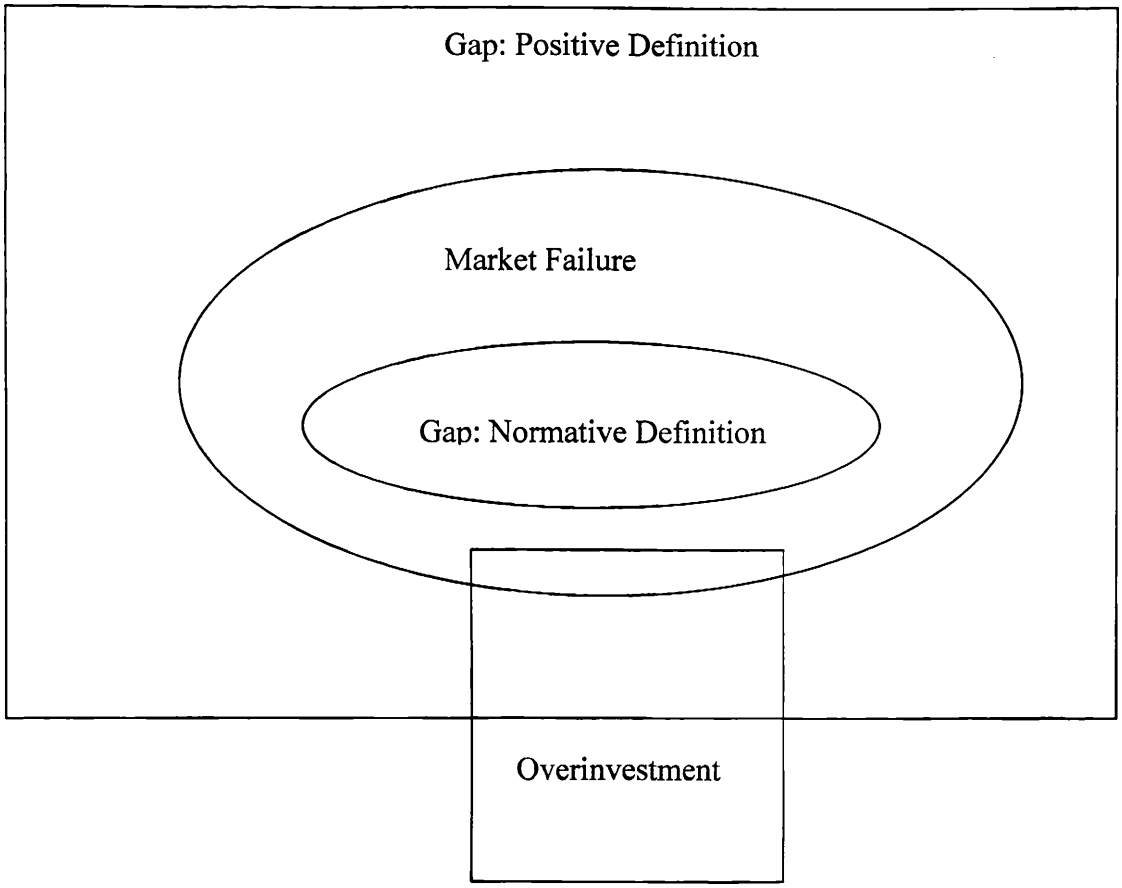
summarizes the two approaches that emerged from the debate. He defines an equilibrium, in which the volume of funding is below that which would emerge in a perfectly competitive market in the aforementioned sense, as a 'positive' funding gap. A 'normative' funding gap is defined as a market failure, for which the appropriate policy response leads to an increase in the volume of funding. A 'positive' funding gap is then interpreted as a necessary but not sufficient condition for a 'normative' funding gap.

Since the two definitions provided on the symposium as an overview represent only the two extreme ends of possible market situations it seems worthwhile to analyse the issues involved in more detail. Two further market situations should be added. The first one tackles transaction cost which do not imply a market failure. The second is a market failure where a policy to increase funding is not appropriate. Furthermore one should become embroiled in further issues related to market failures. In general a market failure can exists for (at least) two reasons: incomplete markets and information failures, though these are not mutually exclusive and are often inter-related. A market failure in private markets exists whenever the market fails to provide a good or service, even though the cost of providing it is less than what individuals are willing to pay (Greenwald/Stiglitz 1986). Positive spill-overs from R&D also belong into this category as the market fails to co-ordinate the actions and preferences of market participants.

3.2.1 An Elaboration of Conceptual Issues of Equity Gaps

The following figure illustrates potential market situations (see Figure 3.1). A positive gap in the sense that investment is lower than it could be under optimal conditions is a necessary condition for a market failure as defined above. The existence of a market failure (and also the existence of a 'positive' funding gap as previously argued) is itself a necessary condition for a gap in the normative sense, where policies may increase overall efficiency. A situation of an overinvestment put forward by de Meza (2002) intersects with some of these definitions.

Figure 3.1: Sets of Market Situations and the Equity Gap



Even when a 'positive' funding gap exists according to the definition that compares the market situation with a perfectly competitive market with costless contracting, there "may be good reason that private producers have failed to provide a particular good or service. There may be large transaction costs associated with providing it" (Stiglitz 1988: 78). If the probability of default or transaction cost are genuine and cannot be changed there is no market failure and no need to close the equity gap perceived as 'deficiency of supply'. Transactions costs associated with venture capital deals do not vary sufficiently with deal size, thus making small deals disproportionately expensive to execute. Thus it is often argued in the UK that the basic costs associated with due diligence and related project screening and evaluation do not differ appreciably whether the deal size is, say, £250,000 or £5m. The deal costs/deal size ratio thus tends to

militate against new small projects, and it is this segment of the market that has most often been identified with the equity gap (Cruickshank 2000).

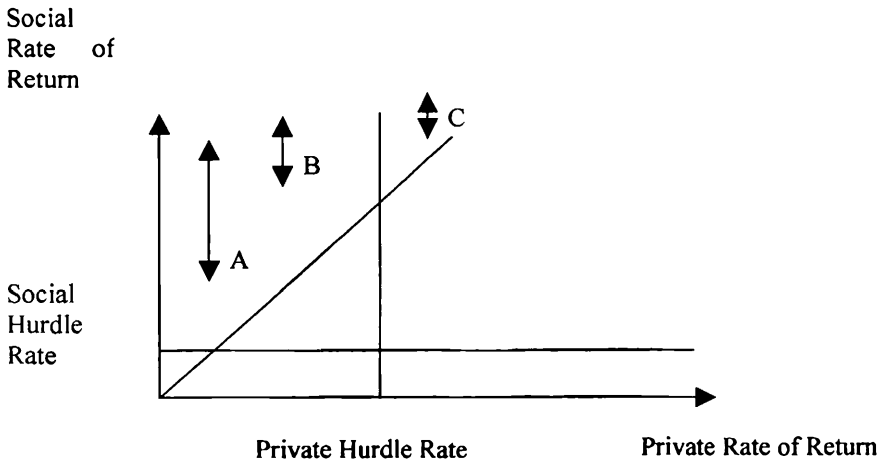
A form of a market failure exists when markets are incomplete because they are segmented. For the venture capital industry there is often a hierarchy of market steps involved, for example from initial cash injections by friends or family, to investments by informal business angels, to investments by active institutional venture capital companies, and finally exit via some route in order to liquidate the fund and realise gains (through an IPO, trade sale, etc). Norton (2001: 242) gives an illustration of a venture capital cycle in which investors from family and friends, to passive informal investors, active informal to institutional venture capital market support the development stages of the product from concept over working model, prototype to production introduction and finally sales. If this chain or tiered system of venture capital co-ordination is incomplete for certain types of investment, a resultant market failure may emerge. For example investors will be reluctant to invest and specialise in seed stages of companies if there is no relay/following market segment in which other investors provide an exit option for the original investor. Venture capital activity remains constrained if it suffers from shortcomings on both side of its market segment – when it is not fed by developing early stage projects on the one hand, and when the state of the stock market and of the unquoted market for trade sales restricts later exit options on the other hand (Murray 1993). A government task could then be to co-ordinate and build the surrounding infrastructure for these markets because independent decisions made by market actors will not create these adjunct markets and also will not close the gap. Hence, there may be a need for a tiered system of venture capital co-ordination, that relates to the different growth phases of VC start-up companies (Harding 1999: 20).

One reason for market failures that can render policy intervention useful in order to reach a social optimum are positive knowledge spill-overs in R&D (Lerner 2002). If firms cannot extract the value of innovation exclusively for themselves, for example via patents, other market participants, firms and consumers, will participate in the benefits of the innovation. Therefore the incentive to invest in R&D for an individual firm is too

low to reach a social optimum. In comparison, costless and complete contracting would make all benefactors contribute to the cost of developing the innovation.

Policies could try to reduce the transaction cost for the individual firm by creating an infrastructure that promotes the possibility of negotiations between the market participants, or policies could try to improve the incentives for the firm and investors to engage in R&D investment directly. The following figure illustrates the relationship between private and social rates of return when there are positive spill-overs.

Figure 3.2: Private and Social Returns of Investment Projects



Source: Design of Graph adapted from Link/Scott (2001)

As there are no negative external effects but only positive spill-overs, all investment projects are located on or above the 45 degree line. The social return rate is at least similar to the private return rate. Private investment decisions made individually will only take place if the private return rate covers at least the private hurdle rate, which mainly represents the private refinancing cost. Therefore these projects have to be located to the right from the 'private hurdle rate', for example investment project C. The social hurdle rate is lower in comparison to the private hurdle rate because public institutions have in general lower refinancing cost than private investors. Either public institutions proceed with their projects on their own behalf, or they encourage private investors to take out investment projects that would otherwise be below the private

hurdle rate, for example projects A and B, that are initially below the private hurdle rate. Delegating private actors to invest may increase the efficiency due to a market approach and competitive forces. Hence the arrows express the potential for higher social return. In the same way, private investment projects covering the private hurdle rate can be influenced to take account of and to target social returns, so that project C reaps a higher social return rate than initially and individually planned.

In the UK, for example, not only has the venture capital market preferred MBOs to new high-tech start-ups, but annual rates of return on early stage investments have tended to be lower than those on later stage investments (Bank of England 2001). This experience leads venture capitalist investors to give young high-tech enterprises a wide berth, in favour of large established companies, that have a proven track record, are involved with less risky and tested technologies and have a more certain rate of return. While this may reflect problems on the demand side (too few good early-stage projects), it can also be a consequence of the high transaction and agency costs of this kind of investment.

Another important cause for market failures that is often discussed concerns information failures and asymmetries, and the problems of moral hazard and adverse selection to which these give rise. One area of the venture capital market where these problems may be most damaging to capital supply is again that of young high-tech firms (Carpenter/Petersen 2002). Such ventures are by their nature very risky, the failure rate is high, and potential financial returns are uncertain. Disagreement between the investee company and the venture capital company may simply arise due to a divergence of belief. Disagreement stems from divergence of beliefs about the pay-off probability distribution or from conflict of interests that stem from asymmetric pay-offs, different utility to risk or different endowments portfolios (Hirshleifer/Riley 1992). The investee company may have to invest too much to provide information in order to persuade the venture capital company of the 'real' value of its idea. These problems are further aggravated when entrepreneurs, as such, are considered to be in general over-optimistic in their assessment of success and growth or are considered to maintain 'animal spirits'.

Although the process of due diligence is intended to bridge this information gap, and venture capitalism is itself based on 'relationship investment' (in which the venture capital company takes on a close and continuing relationship with the firms in which it invests), nevertheless major information asymmetries, which can be defined by a consensus that one side has better information, are likely to characterise new, especially high-tech start-ups. The opaqueness of new technologies, the lack of a track record, and in certain cases few physical assets, imply that venture capitalists are typically less well informed about these projects compared to their entrepreneurs. Without collaterals, capital does merely exist in the form of an option value to produce and size the investment opportunity based on the idea of the entrepreneur. Entrepreneurs, who do not contribute a significant amount of their own assets to the project, have three reasons to put the value of an investment opportunity in a better light than it is. First, successfully communicating a higher than 'real' value of their ideas will bring them a bigger negotiated share of future income. Second, entrepreneurs will merely participate in the upside chance of the investment leading to tendencies not to be transparent about the risks involved. Third, once the project starts hidden action and moral hazard give rise to opportunities for consumption on the job. Due to the asymmetric pay-outs entrepreneurs, who are not risk averse, will also aim to switch to riskier investment strategies if these promise a higher expected return rate.

Signalling and screening may offer a way out of this dilemma and lead to better investment decisions, but, of course, cost are involved. Producing a signal about the quality of an investment project should be sufficiently more expensive for entrepreneurs with less promising investment opportunities, so that they refrain sending a signal. For investors screening the quality of an investment project can lead to a solution in which capital is only offered with attached strings that an entrepreneur with less promising investment opportunities would not take. The 'ex ante' design of incentive compatible contracts between investee company and the venture capital company is a complex task as it has to reflect individual characteristics of the project and potential future developments without restricting the flexibility in upcoming managerial decision. It cannot be done in a perfect way that avoids all of these conflicts. Reid (1999) analysed relationships between venture capitalists and entrepreneurs and concluded that settled

implicit and explicit contracting embodies "much specialized 'time and place' information so that the notion of a typical or representative optimal contract was meaningless" (Reid 1999: 300). The fine details of information provision and monitoring within the investor/investee relationship defy a unique contracting outcome. Whereas screening, signalling and designing a contract bear costs even before an investment decision is made, monitoring the behaviour of the investee's management is an ongoing undertaking, that also proves to become more difficult and costly the larger the geographical distance between investor and investee becomes. A 'hands on' approach provides managerial advice but also implies that major conflicts between entrepreneurs and investor can be avoided. In comparison to business angels, venture capital companies rather attempt to reduce their risk via 'ex ante' contracting and less via flexible 'ex post' monitoring (von Osnabrugge 2000). Entrepreneurs are, however, reluctant to give up management rights and control. Having to do this upfront may explain why they tend to mistrust venture capital involvement.

Some authors argue that there is no deficiency in the supply of venture capital, but a demand gap. Rather than sponsoring venture capital funds, policies should attempt to fill knowledge and information gaps on the side of the entrepreneur and make them 'investor ready' (Harrison/Mason 2000, Mason/Harrison 2003). The case for a theory of overinvestment is put forward in one article of the 2002 Economic Journal symposium on equity gaps. If problems of adverse selection and moral hazard are inevitable or not tackled by government policies, programmes to increase the funding of the venture capital industry may lead to overinvestment and lower efficiency. Especially when entrepreneurs are overoptimistic with regard to their investment projects and request amount of finance that is not justified by the projects expected returns and probability of default, a reduction of the finance available would reduce adverse selection. Less capable entrepreneurs, who received finance simply because they could pledge more of their own capital to the project or provide more collaterals then other entrepreneurs, would have to leave the market and become employees. Therefore funds could be directed to entrepreneurs with a higher competence (de Meza 2002).

Though a theory of overinvestment somehow rests on the assumption of full employment and will probably be put forward less often after the boom years of the venture capital industry was followed by a pronounced slum, it indicates clearly that market failures induced by information problems are not easy to solve. Straight forward policy advice is therefore hardly available. Furthermore policies with their own inherent potential failures and debt weight losses may not necessarily improve the overall outcome for the economy even when there is an insufficient supply of funds. When information problems are, however, the cause of market failures, one emphasis in developing financial institutions could "be on the national collection of investment opportunity information rather than just on pooling national funds" (Greenwald et al 1993: 91).

3.2.2 Economic Paradigms and the Regional Dimension of Equity Gaps

The development of regional and local financial institutions and their financial position may foster regional development (Porteous 1995). It can also contribute to this task of collecting investment information. Regional differences in venture capital investment intensity may arise because of geographical variations in economic structures, such as the rate of small firm start-ups, the sectoral composition of industry, the relative significance of innovative and high-tech enterprise, the overall level of regional economic buoyancy, and so on. When venture capital and private equity finance is a preferred solution for specific market structures, and when regions differ with regard to these market structures, it is to be expected that VC and PE activity is uneven in the regions. Such structurally based regional differences can hardly be interpreted as 'regional equity gaps'. This interpretation would only be justified if regional differences in venture capital investment reflected not just geographical variations in economic structures, but also a specific regional risk perceptions, the operation of explicit spatial proximity or related clustering effects of the venture capital industry that led to under-funding in some regions relative to others.

Split in different paradigms, economic theory offers several different starting points to explain regional funding gaps (see table 3.1; for an overview of some issues involved see Dow/Rodriguez-Fuentes 1991). For Neo-Ricardians regional differences in the profit rate direct capital flows and determine regional economic activity. The profit rate is itself determined by the regional wage bargaining process or regional productivity differentials. In the neoclassical view regionally segmented capital market hamper capital mobility and transaction costs imply price and cost dispersals in finance. Opportunity cost in obtaining information on returns increases with the remoteness of the investee company and is easily added into the neoclassical framework (Roberts/Fishkind 1979). Within the Neo-Keynesian approach incomplete capital mobility is interpreted as a result of regional information-based capital market imperfections with asymmetric information. Problems of adverse selection and moral hazard induce more severe finance constraints when investors from other regions have less local information. The regional supply of funds consists therefore primarily of those provided by regional financial institutions and depends on the wealth of these institutions (Greenwald et al 1993). The Post-Keynesian approach highlights the role of regional liquidity preferences. These influence both demand and supply for regional funds. However, there is the general danger that regional risk and also regional uncertainty are simply categories used to explain finance constraints that could not be explained otherwise and hence serve as a black box. If less favourable finance conditions in a specific region cannot be explained by differences in firm specific variables and the variables of the financing relationship between investee company and financial institutions it may be concluded that companies in the region suffer from higher regional risks or are simply discriminated against (Neuberger 2000). "The determinants of regional risks are explained by regional theories, which analyze how birth, growth, and death of firms depend on regional variables and why some regions have higher economic growth rates than others." (Neuberger et al 2001: 3-4) The danger of a circular argument looms large, since it is not clear whether it is the real sphere of the economy that determines the financial sphere, or whether it could not also be the other way around.

Table 3.1 aims to provide a short overview of different economic paradigms, their arguments and policy advices.

Table 3.1: Economic Paradigms and the Equity Gap

	Neoclassic	**Neo-Keynesian**	**Postkeynesian**	**Neo-Ricardian**
Paradigmatic focus	microeconomics, intertemporal preferences, efficient ressource allocation	asymmetric information, micro foundation of keynesian macroeconomics	macroeconomics, liquidity preference	macroeconomics, accumulation, distribution, power
Factors leading to general finance gaps	deviations from underlying assumptions of general equilibrium model: frictions, transactions costs	asymmetric information	liquidity preference	
General policy advice	avoid distortions for markets	design and promotion of an infrastructure for incentive compatible contracts		
Factors contributing to regional gaps	market segmentation	asymmetric information due to remoteness and regional wealth dispersals	regional liquidity preference	regional activity depends on regional profit rate determined by wage rate and productivity
Applied to equity gap	irrelevance of capital structure except for tax incentives favouring debt and bankruptcy cost	hidden action and hidden information within equity finance		
Policy advice	increase capital mobility and avoid market segmentation	promote local financial institutions	promote local financial institutions	
Black spot	unemployment of resources and macroeconomics	uncertainty (not measurable risk)	monetary and finance issues not applied to equity	no finance approach (except with circulation sphere as add-on)

3.3 EMPIRICAL ISSUES: WHERE IS A 'GAP'?

For obvious reasons it would be far easier to analyse and measure phenomena that actually exist in the real world rather than setting out to detect funding gaps. Detecting equity gaps and quantifying their magnitude is not straightforward. Some difficulties involved are mentioned in the theoretical discussion in the previous chapter.

3.3.1 Economic Approaches to Empirical Issues

Empirical research on finance constraints and investment behaviour is first and far most confronted with the task to identify and measure investment opportunities of firms. These are not directly observable, so that adequate proxies for investment opportunities have to act as substitutes. Tobin' q, the ratio of the supply and demand price of capital for the firm, or in other words, the shadow value to firms of additional investment, is hardly measurable. Empirical studies have also not been able to relate it sufficiently to the investment behaviour of firms. Furthermore, to relate it to new investment opportunities it should be based on a marginal analysis according to the neoclassical approach and hence distinguish between the value for the existing capital stock and additional investment. This is, for example, obvious in the case of imperfect competition and also, when investment decisions are not independent from financing decisions. However, the introduction of a marginal q renders the analysis and the measurement even more complicated when expectations are taken into account (Abel/Blanchard 1986). New investment opportunities and new investments are rather linked to expectations of their future profitability than to current profitability. These expectations in turn depend on individual managers, entrepreneurs, firms and investment projects. The problems of measuring marginal q are, however, avoided in a neoclassical approach which uses an Euler equation for describing the firms optimal capital stock and for modelling investment decisions. Here, the investment function is substituted by a dynamic optimisation of capital stock equations and the outcome is compared to the ideal conditions of a classical competitive model without transaction cost (Hubbard 1998: 209). Yet, problems with regard to expectations are neglected.

If firms and entrepreneurs exhibit a maximising behaviour the degree of investment opportunities used should be negatively correlated to finance constraints experienced by these units. However, to detect and measure finance constraints is equally difficult. First, an 'a priory' identification via proxies for constrained firms may oversee that firms may shift groups over time and that hence a cross sectional data pool may not be sufficient to capture important changes of firm's characteristics. Second, proxies for finance constraints have there own shortcomings. For example, a spread between internal and external funding rates is also determined by the risk perception of external investors, which is not simply a function of information cost and incentive problems but also of risk related differences of firms and investment projects. Since the net worth of firms could be a good proxy for finance constraints but cannot be observed directly, many studies use the cash flow of firms as proxy for net worth and hence finance constraints. More elaborated approaches distinguish several proxies, for example, dividend policies and low pay-outs as proxy for finance constraint and cash flow to measure the change in net worth. A positive correlation between a firm's cash-flow and investment is derived (Fazzari/Hubbard/Petersen 1988). However, a link between cash flow and investment may simply reflect conventional neoclassical assumptions and not a constraint of firms in time or cross-sectional. The proxies for net worth and for changes in net worth may also not be independent from changes in investment opportunities. Furthermore, another study found that companies which published most statements about finance constraints in annual reports appeared to be the least sensitive to cash flow with regard to investment. Cash flow would hence not be a good proxy for finance constraints (Kaplan/Zingales 2000). An overview article on financing constraints and determinants of investment, however, concludes that economist agree on two principal findings. First and ceteris paribus, investment is significantly correlated with proxies for changes in the net worth or internal funds. Second, the importance of this finding is especially relevant to firms facing information related capital-market imperfections (Hubbard 1998: 193).

3.3.2 The Regions and the Limited Explanatory Power of Location Quotients

In regional economics exists the general danger that regional risk and also regional uncertainty are simply categories used to explain finance constraints that could not be explained otherwise and hence serve as a black box. If less favourable finance conditions in a specific region cannot be explained by differences in firm specific variables and the variables of the financing relationship between investee company and financial institutions it may be concluded that companies in the region suffer from higher regional risks or are simply discriminated against (Neuberger 2000). "The determinants of regional risks are explained by regional theories, which analyze how birth, growth, and death of firms depend on regional variables and why some regions have higher economic growth rates than others." (Neuberger et al 2001: 3-4) The danger of a circular argument looms large, since it is not clear whether it is the real sphere of the economy that determines the financial sphere, or whether it could not also be the other way around.

The recent article by Neuberger et al (2001) exemplifies the problems involved. It concludes that there is an East-West gap in lending towards SMEs in Germany, because firms located in East Germany pay significantly higher interest rates on loans and also provide more collaterals, which can not be fully explained by the firm specific variables used. Hence the authors point to regional risk factors of regional economic theories. It is however astonishing that the debt-equity ratio is not included as one variable in the analyses as data shows a lower ratio in East Germany and the authors write that the "equity gap between East and West Germany could not be closed, despite large public equity aid programs. The scarcity of equity capital is most severe for SMEs which have no access to the capital market and are not owned by West German or foreign firms" (Neuberger et al: 2). [1] Contrary to the article's result it may well turn out that bank finance is actually stretched to the limits of a suitable capital structure and of the increased risk that goes with it. Therefore banks demand higher collateral and interest

[1] D'Auria et al 1999 and Ewert/Schenk 1998 use the debt-equity ratio as a variable and find that it is positively correlated to the interest rate on loans. D'Auria et al also apply their analyses to regional economics in Italy: A South-North interest rate gap remains even with the debt-equity ratio included in the analyses.

rates. In this case equity finance could be the bottleneck of development and the conclusion would be an East-West equity gap and not a bank lending or general funding gap. Even in this case, however, a change in the regional market expectations of risk and return and a revaluation of equity can change the debt-equity ratio dramatically (and also subsequently the willingness of banks to lend). This demonstrates the circularity of arguments in regional financial economic theories. Changes in the perception of regional risk change the capital structure, whereas equally the capital structure of firms change the risk of investments.

Location quotients can provide a crude measure of potential gaps by comparing actual regional shares of national venture capital investment with 'expected' shares based on some measure for the regional share of local 'potential' demand in the form of investment opportunities. A result below one indicates a lower than expected share and vice versa. But what is the most meaningful measure of local 'potential' demand and investment opportunities? Investment opportunities can hardly be quantified. Regional shares of population, of national GDP, of the national stock of small enterprises, of the national stock of high tech companies, of new start-ups and so on, may all give different results. Assuming, that the creativity of humans across the regions to detect investment opportunities and that investment opportunities are similar across the regions, a 'fair' measurement would relate venture capital investment to the population and analyse whether the flow of these investments increases absolute inequality. A relation to GDP would show whether these investments increase relative inequality between the regions. Many studies (Mason/Harrison 1991 and 2001, BVCA 2002, Martin et al 2003) relate regional venture capital investment to the regional stock of enterprises registered for VAT within the specific region even though headquarters of firms are often located in centres of national economic activity, for example London, which tends to distort the expected values. An alternative is to relate the figure to formation rates, which seems to be a better approach (for example Martin 1989). Partly one cannot avoid the bias mentioned above, but SMEs without activity outside the registration region make up a large share of registrations and de-registrations. A further advantage for an analysis of venture capital investment is that a location quotient for 'early stage' investment can be based on an appropriate share. London and the South East have, however, not only the

highest birth rate but simultaneously the highest death rate. If firms in these regions are characteristically more risky, the capital structure of firms should reflect this, and equity finance should play a disproportionate larger role in comparison to debt finance. A location quotient based on formation rates would partly cover this effect. The following tables show the regional distribution of venture capital investment and different location quotients based on the stock of companies and formation rates for both countries[1]. For the UK a location quotient based on the population is added. They all indicate a relative concentration of venture capital investment in London. Only the location quotient for expansion finance, based on the stock of companies (North West Merseyside) and based on formation rates (North West-Merseyside and Scotland), show some higher results in other regions. For London the indicated concentration declines coherently with the specific location quotient used. It is highest for the population based quotient, lower with the stock of companies, and the lowest with a location quotient based on newly registered firms. A vibrant economy with fast changes in local consumer preferences and high adaptability and innovation potentials of companies represents growth potentials and a high level of individual risk. Given such an economy with higher individual down side risks yet upside chances the relative use of equity for external finance compared to credit should also mirror the structure of the local economy. However, the problem of circularity looms large. Does the financial or real sector of the regional economy determine the other? Is it perhaps simply the regional availability of equity finance and other innovative financial instruments that lead to this 'real' structure of the economy, or is it the other way around?

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[1] Unfortunately, the German Venture Capital Association (BVK) does not provide a regional breakdown according to business stages. The corresponding data was thankfully provided by KfW. It is obviously biased since it only covers investments in which this public institution was involved. Further remarks on the regional distribution of public subsidies and their related location quotients based on the stock of companies are in Martin et al (2003). One argument, provided by KfW, for the relative large share of subsidies to the New Bundeslaender, is that the start-ups rates there are comparatively high. The table confirms this view as all location quotients based on start-ups are lower than those based on the stock of companies. However, the results in 'early stage' for Sachsen-Anhalt and Mecklenburg-Vorpommern are still remarkably high, and it is also the case when compared with some other New Bundesänder. This does not necessarily indicate a top down discrimination against other regions, since the regional distribution of public support appears to be demand driven and it also depends on the activity of regional authorities. Other regions may instead have referred more strongly to tbg programmes that are not covered in the table. DtA and tbg were only recently, at the beginning of 2003, integrated into KfW. However, some national programmes specifically target the New Bundesländer and offer higher percentages of co-investment and guarantees and absolute amounts. .

Table 3.2: Regional Distribution of VC Investment (by Stage) and Location Quotients, UK, (Average for 1998-2001)

Region	Amount (Percent) Total/EarlyStage/Expansions/MBO MBI				Location Quotient (LQ1/LQ2/LQ3) Total			Early Stage			Expansions			MBO/MBI		
London	29.5	31.8	24.0	31.2	2.39	2.02	1.48	2.58	2.07	1.60	1.94	1.56	1.21	2.53	2.03	1.57
South East	19.0	22.8	16.0	20.0	1.40	1.17	1.17	1.67	1.37	1.41	1.18	0.99	0.99	1.47	1.20	1.23
South East & London (Subtotal)	48.5	54.6	40.0	51.2	1.87	1.51	1.34	2.10	1.71	1.51	1.54	1.25	1.11	1.97	1.60	1.42
East of England	6.8	11.5	6.0	6.7	0.74	0.70	0.69	1.26	1.18	1.16	0.66	0.62	0.61	0.73	0.63	0.68
South West	3.8	4.0	3.2	4.5	0.45	0.41	0.46	0.47	0.44	0.48	0.38	0.35	0.39	0.53	0.50	0.54
East Midlands	8.2	3.2	8.3	9.0	1.16	1.09	1.25	0.45	0.46	0.49	1.18	1.21	1.26	1.28	1.31	1.37
West Midlands	8.2	4.0	7.4	9.0	0.92	0.90	1.02	0.45	0.48	0.50	0.83	0.90	0.92	1.01	1.00	1.12
Yorkshire-Humber	4.5	3.3	4.5	4.5	0.53	0.61	0.68	0.39	0.47	0.50	0.53	0.64	0.68	0.53	0.64	0.68
North West-Merseyside	10.1	7.3	17.5	7.3	0.88	0.83	1.01	0.64	0.75	0.73	1.52	1.80	1.75	0.64	0.75	0.73
North East	1.3	1.0	1.6	1.5	0.30	0.54	0.56	0.23	0.40	0.43	0.37	0.64	0.69	0.35	0.60	0.65
Wales	1.3	0.7	2.0	1.5	0.26	0.18	0.38	0.14	0.10	0.20	0.41	0.28	0.58	0.30	0.21	0.44
Scotland	7.8	9.0	9.5	4.0	0.90	1.02	1.19	1.04	1.24	1.37	1.10	1.25	1.45	0.46	0.55	0.61
Northern Ireland	0.5	1.3	0.5	0.3	0.18	0.15	0.24	0.48	0.39	0.63	0.18	0.02	0.24	0.11	0.09	0.14
Total	100.0	100.0	100.0	100.0												

Source: Martin et al (2003): BVCA (2002); Own Calculations: LQ1 & LQ3, DTI: Start-ups 2001, Resident Population 2000;
Note:
LQ1 = (Region's share of national venture capital investment)/(Region's share of national resident population)
LQ2 = (Region's share of national venture capital investment)/(Region's share of national stock of VAT-registered businesses)
LQ3 = (Region's share of national venture capital investment)/(Region's share of newly registered businesses)

Table 3.3: Regional Distribution of VC Investment (by Stage) and Location Quotients, Germany, (Average for 1998-2001)

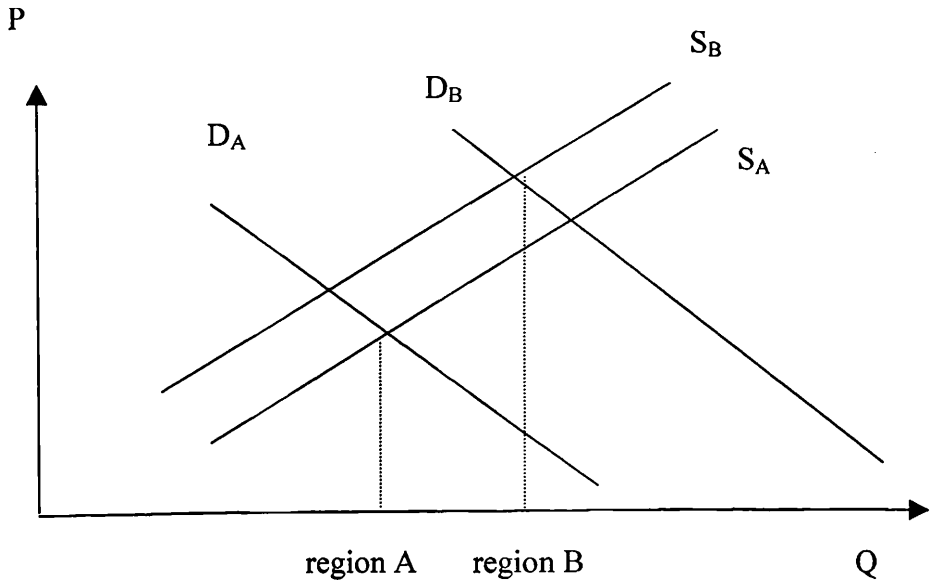
Region (Bundesland)	Amount (Percent)					Location Quotient (LQ2/LQ3)									
	BVK	KfW				BVK		KfW							
	Total	Total	Early Stage	Expansions	MBO/ MBI	Total		Total		Early Stage		Expansions		MBO/MBI	
Baden-Württemberg	13.3	13.8	11.7	15.0	36.3	1.05	1.06	1.10	1.10	0.82	0.93	1.07	1.2	2.59	2.89
Bayern	21.1	24.5	22.6	27.7	0.9	1.21	1.27	1.46	1.47	1.30	1.36	1.59	1.66	0.02	0.05
Southern Germany	34.4	38.3	34.3	42.7	37.2	1.09	1.18	1.26	1.31	1.10	1.17	1.36	1.46	1.18	1.27
Berlin	9.7	13.6	15.2	12.1	8.6	2.55	2.25	3.68	3.15	3.98	3.52	3.17	2.81	2.25	1.99
Brandenburg	2.2	2.6	2.3	3.0	4.0	0.83	0.75	1.01	0.89	0.86	0.78	1.12	1.02	1.50	1.36
Bremen	0.6	0.7	1.3	0.1	0.0	0.81	0.86	0.89	1.00	0.94	1.86	1.75	0.14	0.00	0.00
Hamburg	5.0	5.9	7.5	4.4	1.5	1.89	2.06	1.87	2.43	2.34	3.09	1.37	1.81	0.46	0.62
Hessen	10.5	4.9	4.8	5.2	0.0	1.34	1.20	0.62	0.56	0.72	0.55	0.79	0.6	0.00	0.00
Mecklenburg-Vorpommern	0.7	3.7	4.5	2.9	0.0	0.40	0.36	2.18	1.92	2.58	2.33	1.66	1.5	0.00	0.00
Niedersachsen	4.4	2.8	3.0	2.7	1.9	0.51	0.52	0.33	0.33	0.34	0.35	0.31	0.32	0.22	0.22
Nordrhein-Westfalen	20.3	8.9	10.6	7.5	0.0	0.84	0.98	0.34	0.43	0.49	0.51	0.35	0.36	0.00	0.00
Rheinland-Pfalz	2.7	1.4	1.0	1.5	7.2	0.52	0.53	0.62	0.27	0.27	0.2	0.20	0.29	1.41	1.41
Saarland	0.9	0.4	0.5	0.2	0.0	0.25	0.77	0.34	0.34	0.42	0.43	0.17	0.17	0.00	0.00
Sachsen	3.6	9.1	6.5	11.1	28.4	0.78	0.70	2.18	1.78	1.39	1.27	2.38	2.17	6.08	5.55
Sachsen-Anhalt	1.2	3.2	5.4	0.7	0.0	0.52	0.46	1.46	1.22	2.34	2.05	0.30	0.27	0.00	0.00
Schleswig-Holstein	1.9	2.0	1.6	2.2	11.3	0.55	0.51	0.57	0.54	0.46	0.43	0.64	0.59	3.27	3.04
Thüringen	1.8	2.4	1.7	3.5	0.0	0.71	0.65	0.98	0.87	0.67	0.62	1.38	1.27	0.00	0.00
Total (without subtotal)	100.0	100.0	100.0	100.0	100.0										

Source: Martin et al (2003): BVK, KfW; Own Calculation: LQ2: Gewerbeanzeigenstatistik 2001: Gewerbeanmeldungen, insgesamt.
Note: Totals for KfW include 'Other' category of investment; Location Quotient (LQ) defined as:
LQ2 = (Region's share of national venture capital investment)/(Region's share of national stock of VAT-registered businesses)
LQ3 = (Region's share of national venture capital investment)/(Region's share of newly registered businesses)

Location quotients can be used to provide some information about what might be an expected volume of venture capital investment or a 'fair' share. However, they do not tell why actual regional shares deviate from 'expected' shares, or whether regional investment shares are demand or supply constrained. It would certainly be misleading to interpret venture capital invested in a region as supply and the stock of companies or the formation rates as related to demand, which is either sufficiently served or not. These categories are not proper demand or supply categories and even if one had proper demand and supply categories a location quotient of less than unity would not necessarily indicate a lack of supply since there may also be a lack of demand. One should bear in mind that the size of all categories mentioned are market results of demand and supply. After Marshall and his pair of scissors these market outcomes are the result of factors that determine demand and supply which can be independently analysed. The observed market outcome is the quantity of venture capital demanded and supplied. Both are, of course, the same. In a graph the market outcome is just a point where demand and supply curve intersect. This provides no information about the further slopes of demand or supply curves, as long as the determining factors are not known or analysed. There can, for example, exist a regional supply gap even when the market result of venture capital invested (quantity supplied and demanded) is comparatively high, when a very strong demand by entrepreneurs prepared to pay a relatively high price for capital has lead to a high investment level although investors are very reluctant to supply venture capital in this region because they are aware of comparatively high transaction cost or other factors that hamper the supply of capital. The figure 3.3 offers an illustration in the style of an economics textbook. Region A shall be an average representative region. Region B has a stronger demand of entrepreneurs for venture capital finance. Perhaps new oil fields were discovered, which offer additional investment opportunities for drilling stations and refineries. The supply of venture capital is however lower, be it transaction cost due to the spatial distance from national financial centres, or, perhaps, a higher perceived regional risk due to a regional economic mono-structure. Location quotients would indicate a relative concentration of venture capital investment and not an existing supply gap. Hence, it is not very surprising that the location quotients mentioned and presented above are normally only used in business studies and geography in order to detect finance gaps,

often very uncritically, misleading and confusing the involved issues. A proper economic analysis of demand und supply is, however, confronted with the difficulties of detecting and measuring the determining factors. Furthermore, if demand and supply factors are interdependent, as it would be the case when profit expectations and liquidity preference for a region effect investors and investee behaviour simultaneously (Dow/Rodriguez-Fuentes 1991: 915), an entire independent analysis of demand and supply would not be possible and the talk about a supply gap or a demand gap would not make much sense. Deficiencies of supply and demand may also reinforce each other so that there is a problem of circularity. In the illustration provided another example for region B and an interdependence of demand and supply is a situation in which demand is relatively high because many entrepreneurs in that region tend to be more overoptimistic due to regional cultural differences. National investors know this but find it difficult to distinguish between regional entrepreneurs.

Figure 3.3: Demand, Supply, Market Outcome and Equity Gaps



3.4 CONCLUSION

An article in a recent symposium on equity gaps in the Economic Journal summarises empirical approaches used by economist so far in order to detect funding gaps empirically (Cressy 2002: 2-3):

1. the labour market switching criterium
2. the net-worth investment criterium
3. the Euler equation approach
4. the self-assessment criteria

The first criteria checks for funding gaps indirectly asking whether individuals who have own funds at hand invest more than others. In more precise words, it is asked, whether there is a positive correlation between self-employment and individual assets (Evans/Jovanovic 1989). The second criterium is similar but related to firms. The last approach mentioned is to examine the perception of gaps by market participants themselves. Identifying and measuring perceptions is, however, also problematic. Entrepreneurs who fail to secure venture capital funding tend to argue that there is an equity gap, and that the cause is a deficiency on the supply side. But the fact that requests for finance are turned down can hardly be a reliable indicator of a gap, since high rejection rates may simply reflect a poor quality of proposals as revealed by initial screening and due diligence, rather than constraints on capital supply (Bannock Consulting 2001). Also, and again, transaction cost involved can be genuine, so that no conclusion about normative gaps can be made. Hence, simply asking firms: "Do limitations on the availability of funds influence your decision to start-up/invest/etc?" as Cressy (2002: 3) mentions can only lead to biased findings.

In principle, venture capitalists should be a better source for information on gaps, since they both assess and evaluate the demand for equity capital and manage its supply. They are financial intermediaries and may experience shortages on both sides of supply and demand. As they face asymmetric information on both sides they are, for example, aware of the cost of obtaining information to reduce the downside risk of equity

investment. The involved transaction cost may result in proposals being turned down which investee companies may incorrectly interpret as supply constraints. With larger asymmetries on the investment side of these intermediaries and the time consuming task of searching for investment opportunities, one can, however, expect them to tend towards detecting insufficiencies on the demand side rather than on the supply side. Also, what they may interpret as a lack of demand (flow of viable, investment-ready projects seeking funding) may itself be a function of a perception by entrepreneurs that accessing funds is difficult and thus not worth attempting. Furthermore, managers of venture capital companies may answer strategically, and detect funding gaps and a need for public support in the hope of receiving subsidies. In short, soliciting the perceptions of market agents, even venture capitalists, is fraught with difficulties. Yet, having mentioned the difficulties involved, it is still a very promising way of detecting funding gaps, especially when the results are compared with secondary data. When authors argue that self-assessment is the easiest approach to detect funding gaps (for example Cressy 2002), it is surprising, that so far no survey tried to be precise about the differences of a 'positive' and 'normative' equity gap and addressed the best source for a survey, which are the venture capital companies. Whereas all other economic approaches and results can only detect a funding gaps according to the positive definition and do not take into account that some transaction cost can be genuine, this approach is capable to derive conclusions about normative funding gaps.

CHAPTER 4

PERCEPTIONS OF EQUITY FINANCE GAPS AND THE EFFECTIVENESS OF POLICY INSTRUMENTS: EVIDENCE FROM A SURVEY OF VENTURE CAPITAL AND PRIVATE EQUITY COMPANIES IN THE UK AND GERMANY

ABSTRACT

The chapter presents survey results about equity funding gaps in Germany and the UK. The survey indicates considerable equity gaps in both countries. The perception of 'normative' funding gaps, those that should be tackled by government policies, is, however, more pronounced in Germany. German companies perceive 'risk mitigation' as the most effective policy instrument. In contrast UK companies are rather critical towards government intervention, public co-investment in funds would be their first choice. The evaluation of policy instruments indicates the existence of a trade-off between potential positive spill-overs in employment and productivity on the one hand and negative effects on failure rates and realised returns on the other. A proclaimed 'demonstration effect' for the English Regional Venture Capital Funds is therefore unlikely to work. In Germany guarantees have significantly increased investment failures and also motivated private equity companies to invest in higher risk areas for which they have not developed adequate instruments, notably a hands-on approach with strict monitoring and managerial advice.

JEL: G24, G28, P52, R12

4.1 INTRODUCTION

The issue of 'equity gaps' has loomed large in recent discussions of enterprise formation and development in both the United Kingdom and Germany. In Germany where a bank-based financial system of regional and national banks offers relationship banking with the so-called Hausbanken a discussion about a lack of risk and equity finance only surfaced recently with the emergence and promotion of venture capital markets in the 1980s and 1990s. In contrast, a related debate, why especially SMEs receive insufficient finance despite well developed capital markets and how this could be overcome, can be traced back for many decades in the UK. The equity gap question has been closely bound up with a recurring debate over finance for SMEs that started with the Macmillan Report in the 1930s, was followed by the Radcliffe Committee in 1959, and resurfaced in the 1970s the Wilson Report. A recent addition to the discussion, the Cruikshank Report, was published in 2000. Much of this debate has focused on the difficulties and high charges that small and medium sized enterprises experience in obtaining loan finance and credit from the British banking system, yet banks have consistently denied that they restrict finance and argued that the problem is not one of under-supply but of a lack of viable projects. Venture capital companies in the UK steer much of their funds towards less risky investments. Most of their activity is focussed on expansions finance and MBOs in the so called 'old economy'. However, 'New Labour' started initiatives that target the seed, start-up and low deal size market.

A large public support for the emerging venture capital industry in Germany made it recently much easier for riskier seed and new start-up projects in the high-technology sector to receive venture capital finance there. On the other hand two new developments in banking regulation endanger the traditional relationship banking with SMEs and their easier access to bank finance. An EU regulation to scrap the state guarantees to state banks in 2005 increases their refinancing cost and reduces their large market share in the banking sector. The new risk related capital adequacy requirements of Basle II look likely to be ratified and hence introduced in 2006. This tends to increase the cost for all banks lending loans to SMEs, especially in the risk prone high technology sector. Venture capital and private equity finance is targeted to fill this upcoming gap.

The research leading aims of this chapter are two-fold. It presents perceptions of equity gaps according to a conducted survey and evaluates current policy instruments in both countries. A survey of venture capital and private equity companies in Germany and the UK was conducted at the University of Cambridge in co-operation with Kreditanstalt für Wiederaufbau (KfW) (see Martin et al 2003). It created a large data pool on the basis of the completed questionnaires that were received from September 2002 until the end of November 2002. Despite some hints of a pronounced survey fatigue on the side of venture capital companies the survey received excellent response rates of 38 percent in the UK and 52 percent in Germany[1]. The participation of KfW and the support of the German Venture Capital Association (BVK) contributed to the higher response rate in Germany.

The survey aims to get indicators for gaps in several ways. One way is to ask the venture capital companies directly, whether there are any market gaps and where they perceive them. The survey covers these aspects by asking, whether there are any market segments where venture capital and private equity companies perceive there 'to be an under-supply of venture capital relative to demand' (question C1 and C2; the questionnaire is attached as appendix A and appendix B). Another approach to detect market gaps is to ask venture capital companies about their perception of the main constraints on their own company's investment activity (question C3). The results can then also be related to general characteristics of the company (part A), investment behaviour (part B) or public programmes (part D). Furthermore, the wording of the question (C3), with a focus on the firm's experience, allows respondents to provide information on investment barriers even when they do not have sufficient information about competitors and the whole market.

The indicators mentioned so far do not provide information about gaps according to the normative definition, as explained in chapter 3.2. A correct phrasing of a question with regard to the perception of positive equity gaps would also have to be based on the

[1] Questionnaires were sent out to all 162 ordinary members of the British (BVCA) member list in summer 2002. It turned out that 4 were not active anymore or simply not known to the post office. The numbers for Germany were 209 and 2 respectively. A reminder was sent to those that did not respond in the first round. 60 completed questionnaires were received from the UK and 107 from Germany until the end of November 2002.

assumption that the respondents have far reaching analytical skills. Since public programmes to support the venture capital industry are in place, it would have to be hypothetical and would have to ask whether there would be any gaps if those programmes did not exist. Instead, a related question in the policy section of the questionnaire (part D) tries to identify gaps according to the normative definition. It asked where the venture capital companies 'see a special need for public finance' (question D8).

Finally, the survey analyses the effectiveness of instruments to close a gap. Simply shedding some light on preferred instruments, would relate issues of crowding out and complementarity or additionality of public support to potential profits of venture capital and private equity companies and not analyse the instruments with regard to the envisaged policy target. Instead, a question in the survey asked therefore which aspects of public programmes have caused venture capital companies 'to make investment which otherwise would not have occurred' (question D5).

The research methods used in this chapter are common and examine four types of data:

1. Published and unpublished information obtained from the British and German venture capital associations, from the KfW and DtA in Germany, and from a number of other national and regional institutions involved in venture capital policy in the two countries
2. Information obtained from a purpose-designed postal questionnaire survey of UK and German venture capital companies, which was based on elaborated conceptions of equity gaps (see Appendix A and B, and Chapter 3)
3. Data from semi-structured interviews with individuals in key national and regional institutions and bodies in the two countries (see Personal Interviews)
4. A statistical analysis of the data obtained (see Appendix C ff)

4.2 SURVEY RESULTS: IS THERE A 'GAP'?

The survey results indicate considerable equity gaps in the UK and Germany, according to both the positive and normative definition. The perception that there are market segments or regions where there is an 'under-supply of venture capital relative to demand' is remarkably similar in both countries. 70.2% in the UK and 68.3% in Germany answered that gaps exist[1].

4.2.1 The Perception of Existing 'Gaps'

Participants could subsequently describe the kind of gap they perceived. Gaps could be detected in market segments of the following categories: business stage, deal size, company size according to sales and region. Multiple answers and combinations were possible. The relevance given to these categories differs in both countries (see table 4.1)

Table 4.1: The Relevance of Market Categories in the Perception of Supply Gaps

Categories	Germany (N=104)			UK (N=57)		
	Rank	%	Number	Rank	%	Number
Business stage	1	61.5	64	2	66.7	38
Deal size	2	55.8	58	1	68.4	39
Sectors	3	50.0	52	3	36.8	21
Company size (sales)	4	43.3	45	4	35.1	20
Region	5	28.8	30	5	15.8	9

Source: Own Survey

[1] These are the valid percentages. If respondents, who left this questions blank, that is 3 in Germany and 3 in the UK, were considered to be relevant for the base, the percentages would hardly change: 66.7% for the UK and 66.4% for Germany. The set of questions in C2 are somehow ambiguous. As there are no 'no' boxes in the questionnaire for the categories and segments of equity gaps, one cannot distinguish between respondents who simply failed to answer it or who actively expressed that no gap exists in this category or segment. This is however necessary for a separate 'valid' distribution. Yet the questions C1 and C2 are linked and one should use the same number of valid responses as a base for the distributions presented. Three respondents in each country did neither answer C1 nor C2. For a full explanation of the statistical problems involved and their treatment see Appendix C "Statistical Problems of the Gap Perception in the Survey and Their Treatment".

In Germany, the gap perception is predominantly one of business stages. In second position follows deal sizes and then sectors, company size and finally regions, which is given lowest relevance. The ranking is the same for the UK with the exception that deal size is considered to be the most important issue, downgrading business stages into second place. Business stage and deal size get higher results whereas sector, region and company size are considered less important issues in comparison to Germany.

The leading position of 'deal sizes' in the UK may reflect that equity supply gaps are slightly different in both countries and indicate the need for policy initiatives with different targets. The new 'Regional Venture Capital Funds' in the UK target a deal size area and the differences between both countries in the area targeted, from £250.000 to £500.000 is very marked.[1] However, the high results in surrounding deal size areas in the UK suggest that equity funding gaps are not constrained to one specific deal size area. UK government programmes, that exclusively focussed on a specific deal size area, have therefore been criticised (for example Harding 1999) (table 4.2).

Table 4.2: The Perception of Gaps According to Deal Sizes

Germany		UK	
Deal Size	Percentages	**Deal Size**	Percentages
< €150 th	37.5	< £100 th	42.1
€150-375 th	42.3	£100-250 th	50.9
€375-750 th	23.1	£250-500 th	47.4
€750-1500 th	11.5	£500-1000 th	35.1
€1.5-5 m	10.6	£1.0-3.33 m	21.1
€5-50 m	3.8	£3.33-33 m	1.8
> €50 m	3.8	> £33 m	1.8

Source: Own Survey

The difference in perceptions between both countries may also simply reflect that the public discussion is concentrated on this particular aspect and target area. In a previous

[1] To aid comparisons between the two countries an average conversion rate for 2001/02 of €1 = £0.66 was used throughout the survey.

part of the survey the companies were asked about the approximate percentage share of the overall number of investments over the calendar years 1999 to 2001 that were allocated to different classes of deal size (question B7). A difference for this particular deal size between the UK with a mean of 12.4% and Germany with 15.5% hardly exists. The activity in the UK is rather more evenly distributed over all deal sizes (table 4.3).

Table 4.3: Deal Sizes and Their Mean Percentage Share of the Overall Number of Investments (1999-2001)

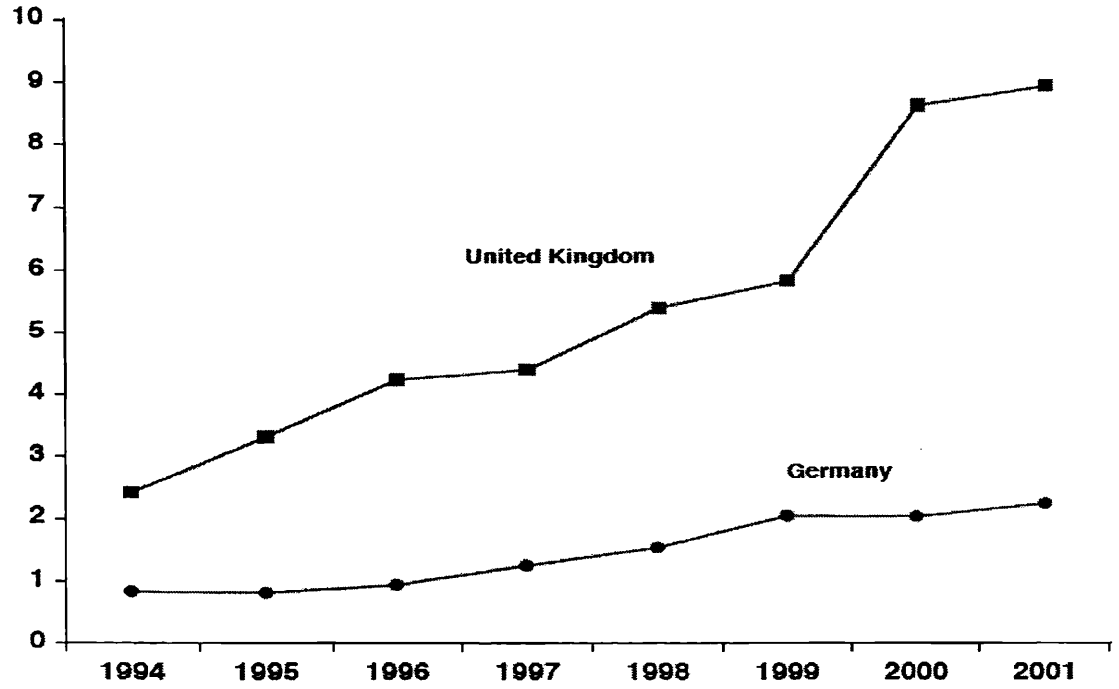
Germany (N=99)		**UK (N=52)**	
Allocation to Deal Size	**Mean of Percentages**	**Allocation to Deal Size**	**Mean of Percentages**
< €150 th	7.1	< £100 th	11.4
€150-375 th	12.5	£100-250 th	12.3
€375-750 th	15.5	£250-500 th	12.4
€750-1500 th	17.6	£500-1000 th	11.0
€1.5-5 m	30.5	£1.0-3.33 m	14.4
€5-50 m	11.2	£3.33-33 m	25.0
> € 50 m	5.2	> £ 33 m	12.4

Source: Own Survey

Secondary data shows a significant rise in the average deal size suggesting that equity gaps at the lower end of deal sizes became more severe in the UK (figure 4.1).

Assuming that the size of the investee company by sales and deal size is correlated one would also expect to get comparable results for the gap perception. Yet, opposed to deal sizes, the size of the company is considered less relevant in the UK and only 31.6 % perceive a gap for companies with annual sales below £10 million (€15 million). The figure for Germany is higher with 41.3%. For the range of £ 10-20 million (€ 15-30 million) this is 3.5 % and 8.7 % respectively. Additionally, 71.6% of the respondents in Germany in comparison to 52.6% in the UK do not have a minimum threshold size of a potential investee company (question B9, see table 4.4).

Figure 4.1: The Rise in the Average Size of Investment, 1994-2001 (in million €)



Source: BVCA and BVK

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The different business stages of potential investee companies are given a high importance in the perception of equity gaps in both countries. Seed and start-up are the most important segments whereby start-up plays a smaller role in the perception of German companies (table 4.5).

Table 4.4: Perception of Gaps according to Company Size (Annual Sales)

Germany		UK	
Company Size	Percentage	**Company Size**	Percentage
< €15 m	41.3	< £10 m	31.6
€15 – 30 m	8.7	£10 – 20 m	3.5
€30 – 50 m	1.9	£20 – 33 m	1.8
€50 – 100 m	3.8	£33 – 67 m	0.0
> €100 m	2.9	> £67 m	0.0

Source: Own Survey

Table 4.5: The Perception of Gaps according to Business Stages

Business Stage	**Germany** **Percentage**	**UK** **Percentage**
Seed	49.0	52.6
Start-up	35.6	54.4
Expansion	13.5	7.0
MBO/MBI	3.8	1.8
Replacement	2.9	3.5
Bridge	2.9	5.3
Turnaround	27.9	10.5

Source: Own Survey

Secondary data from the venture capital associations confirm the survey results that show a lower perception of equity gaps in the start-up and seed stage in Germany. In comparison to the UK and due to public programmes (Adelberger 2000, PricewaterhouseCoopers 2000), the venture capital activity in Germany concentrates more on early stage and start-ups, although even in Germany a tendency towards later stage finance exists which dominates the activity in the UK (table 4.6).

Table 4.6: Venture Capital Investment by Stage

	Germany (Percent)				UK (Percent)			
Business Stage	1998	1999	2000	2001	1998	1999	2000	2001
Early Stage	25	33	36	26	8	6	11	9
Expansion	50	53	48	37	22	19	33	34
MBO/MBI/LBO	25	14	16	37	70	69	56	57
Total	100	100	100	100	100	100	100	100

Source: British and German Venture Capital Associations; Note: Expansion includes Replacement, Turnaround and Bridge Finance

On the other hand 27.9 % believe that there are equity gaps in the turnaround stage whereas only 10.5 % in the UK agree with this opinion. This result is related to a rather astonishing result in the sector category: with 32.7% and compared to 8.8% in the UK 'Manufacturing, low tech, "old economy"' is perceived to be sector that suffers the strongest from equity gaps in Germany.

Table 4.7: The Perception of Gaps according to Sectors

Sector	**Germany** **Percent**	**UK** **Percent**
IT, telecommunication, media	15.4	21.1
other business & personal services	19.2	7.0
manufacturing, high tech	14.4	10.5
manufacturing, low tech, "old economy"	32.7	8.8
life science	10.6	17.5
other	10.6	5.3

Source: Own Survey

However, the typical risk of venture capital financing normally does not exist in this sector and a history of performances can guide expectations and investment planning. Therefore, it is likely that this result partly reflects the new debate about upcoming potential problems in the financing of SMEs. Due to Basle II and the loss of public guarantees for state banks (Sparkassen, Landesbanken) higher refinancing costs for banks are likely to restrict their traditional financing to SMEs and the Mittelstand in the future. Partly banks already started to adjust their balance sheets. That this perception in Germany is a result of the public debate is confirmed by the actual investment behaviour of the venture capital and private equity companies. The mean of the share of gross investment allocated to this specific sector of the economy over the calendar years 1999 to 2001 was in Germany with 17.8% even higher than in the UK with 13.2% (question B19). Secondary data on sector investment from BVCA and BVK are unfortunately not comparable due to the different classification systems used.

The lower perception of gaps in the sectors 'life science' and 'IT, telecommunication, media' in Germany may indicate that public initiatives were successful insofar as they provided sufficient finance for these sectors. On the other hand and despite public programmes a higher percentage in Germany than in the UK perceived gaps in the sector 'manufacturing, high tech'.

From a regional perspective it is remarkable that equity funding gaps are neither in the UK nor in Germany perceived as a regional problem. Venture capitalists tend to think much more in terms of deal size, business stage or sector opportunities rather than recognising or admitting to regional biases or discrimination in investment behaviour. Regions are ranked least relevant, only 28.8 % of the respondents in Germany and only 15.8 % in the UK detected a regional equity gap. Thus, a very low share of the respondents selected particular regions in both countries. The highest perception of regional gaps in Germany exist for the New Bundesländer, whereas the lowest proportion of German companies perceives a gap for Hamburg, which represents a cluster of venture capital firms. Due to the lower sample size for the UK and the low number of regional selections any interpretation for the UK must be made very carefully. There were only 9 venture capital and private equity companies in the UK (30

in Germany) that selected this category, so that the danger of jumping to conclusions looms large. However, the perception of a regional equity gap is the lowest for Scotland and highest for the North West and South West. It is also, surprisingly, quite high for London. Since the survey hardly provides sufficient findings for a detailed discussion of the regional aspects in the perception of venture capital gaps, secondary data and questions about proximity effects and about clusters of activity in the survey have to fill this gap. For a detailed discussion of these regional aspects of venture capital finance in both countries see Martin et al (2003).

4.2.2 Constraints on Investment Activity

Another approach to detecting market gaps is to ask venture capital companies about their perception of the main constraints on their own company's investment activity (question C3). The wording of the question with a focus on the firm's experience allows respondents to provide information on investment barriers even when they do not have sufficient information about their competitors and the whole market. The survey results show that German respondents attach a stronger importance to all listed constraints, with the exception of the constraint 'Problems in fundraising'.[1] Since venture capital and private equity companies are financial intermediaries and best placed to distinguish between demand and supply constraints the exception of the investment constraint 'Problems in fundraising' is significant. German intermediaries perceive potential equity gaps less as a supply problem based on funding difficulties. This may not simply be a result of subsidies to the industry, especially in the form of guarantees and an

[1] To complete the results: In Germany the mean for 'tax problems' was 2.00 (N=13) and for 'others' 2.50 (N=6). In the UK the related numbers are 3.00 (N=6) for 'tax problems' and for 'others' 1.6 (N=10). Respondents could additionally specify their answer in an open question for these two constraints, hence some of them might have been reluctant to fill this question out, however, the low number of respondents rather suggest that these issues were considered as hardly relevant and that the other options given were appropriate. Cultural differences between both countries, for example a tendency to avoid complains on behalf of British respondents, may have led to a partly biased result. A correction factor could be introduced and results for each constraint could be presented as a deviation from an overall average for each country. Furthermore, answers to set of questions like these are often ranked for each respondent and recoded as an ordinal variable (Hartung 1999). Since this would hide the comparative information given by a respondent who found for example many aspects of public programmes important, this procedure was omitted.

overlapping of a positive and normative gap perception, the sources of funds for investment also differ in both countries.

Table 4.8: Main Constraints on Investment Activity

Barriers to Investment	Germany			UK		
	Rank	Ø	N	Rank	Ø	N
Perceived risk involved is prohibitively high	1	2.43	103	3	3.65	54
Lack of proposals with promising returns	2	2.59	105	1	2.79	56
Exit problems	3	2.81	106	2	3.38	56
Difficulties in monitoring investee companies	4	3.61	105	9	4.81	54
Lack of information on potential investee companies	5	3.93	104	7	4.54	54
Low dealflow	6	4.08	104	5	4.27	55
High (fix) due diligence cost	7	4.08	103	6	4.50	56
Problems in fundraising	8	4.19	102	4	4.16	56
Geographical remoteness of investee company	9	4.25	105	8	4.80	56
Shortage of staff with VC experience	10	4.29	105	10	5.00	56

Source: Own Survey, Note: Valid Average Ø; Scale from 1 to 6, 1= very important, 6= not important

In the market based system of the UK, pension funds have tended to be the major source of funds, making up over 40 percent of the total in 2001, followed by funds of funds, banks, and insurance companies. Some 70 percent or more of the funds raised for the UK venture capital industry originate overseas, and much making up much of the balance of the pension fund finance comes from North America. Domestic pension funds have been criticized for not fully exploiting venture capital investment opportunities, (European Commission 1999; Bank of England, 2001), but the volume and share of funds raised by UK pension funds has grown substantially over the past few years to 13 percent in 2001. The Myners review (HM Treasury 2001), lobbying by the BVCA and the government, and the historic superior returns demonstrated by the industry have all encouraged the UK pension funds to recognize the opportunity that venture and private equity present. However, overseas pension funds far outweigh their

UK counterparts as the sources of capital for investment, by more than factor two. UK banks and UK insurance companies raised only 4 percent each of the overall amount.

Table 4.9: Sources of Private Equity Funds in the UK and Germany in 2001

Sources of Funds (in Percent)	Germany	UK
Pension Funds	28	42
Banks	18	14
Insurance Companies	17	12
Private Individuals	12	4
Funds of Funds	11	15
Corporate Investors ("Industrie")	9	2
Public Agencies	6	8
Other	0	3
Total	100	100
Total in € m (€1=£0.66)	10.3	18.4
From Overseas Sources	66	71
From Inland Sources	34	29

Sources: BVCA & BVK 2002; Note: Public Agencies Include Government Agencies and Academic Institutions; BVCA Does Not Include Funds of Their International Members with Headquarters in London, which are Raised "Mainly for Large Buy-Outs, of which the Vast Majority Will Be for Investment Outside of the UK."

In contrast, in the bank based financial system in Germany banks have traditionally been the most prominent investors. They provided over 29 percent of the total new funds for investment in 1999 but their share fell dramatically to about 18 percent in 2001. Similar to the UK, pension funds have become the dominant source for new funds raised, in 2002 their share further increased to over 39 percent. In the UK, however, this source mainly originated from abroad and the relation of national to international sources was turned upside down in 2001. In 2002 the international share fell slightly to 59.5 percent. For Germany, it is not clear how much from this source is invested in Germany. BVK does neither provide a break down with regard to the locations of investments nor does it exclude foreign companies. The share of total investment made

in Germany reached with just over 69 percent its lowest level in 2001 and did hardly increase in 2002. The survey also indicates that investment abroad increased in the three calendar years up to 2001 (question B17). 35 percent of German companies with investments abroad reported an increase, 22 percent reported a decrease. The data provided by BVCA and BVK is therefore not comparable and draws an incorrect picture of national sources and national investments.

The following table illustrates the survey results with regard to the sources on invested capital in the year 2001 (question A9).

Table 4.10: Sources of Funds in 2001

Sources of Funds	Germany (N=103)	UK (N=54)
Internal Finance	27	16
Banks	24	15
Public Sector	17	14
Individuals	12	20
Insurance Company	6	8
Fund in Fund	6	9
Industry	4	6
Pension Fund	3	12

Source: Own Survey; Note: Mean of Percentages

It is important to notice that public guarantees can have a large leverage effect on mobilizing private investment. The net cost may be kept down and fees to pay may be below market rates, so that they are attractive for the purchaser (Bannock Consulting 2001: 35). In comparison to public co-investment their contribution will be underestimated in this table. The public sector played a larger role in Germany than it appears in this table.

A dominant role of banks in Germany is also confirmed in the survey. 26 percent answered that a bank is the largest owner of the venture capital or private equity company. A mere 6.9 percent answered likewise in the UK, where instead individuals, with 46.6 percent form the largest ownership group (table 4.11; question A11). Whereas in the UK financial system the capital markets function as a market for corporate control, the German system is known to have large cross-ownerships of banks and companies. These numbers are therefore likely to disguise an even more dominant role of German banks in the venture capital and private equity market.

Table 4.11: Largest Owner of Venture Capital Company

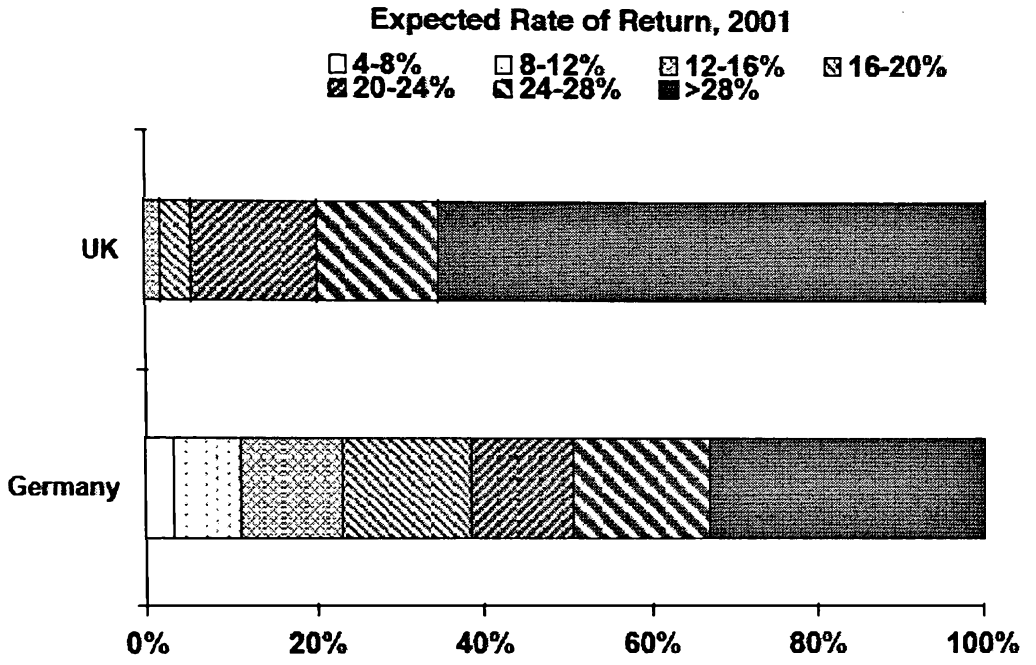
Largest Owner of Company	Germany (N=104)	UK (N=58)
Bank	26.0	6.9
Individual	20.2	46.6
(Semi) Public Body	16.3	12.1
Industrial Company	13.5	8.6
Insurance Company	3.8	6.9
Other	20.2	19.0
Total	100	100

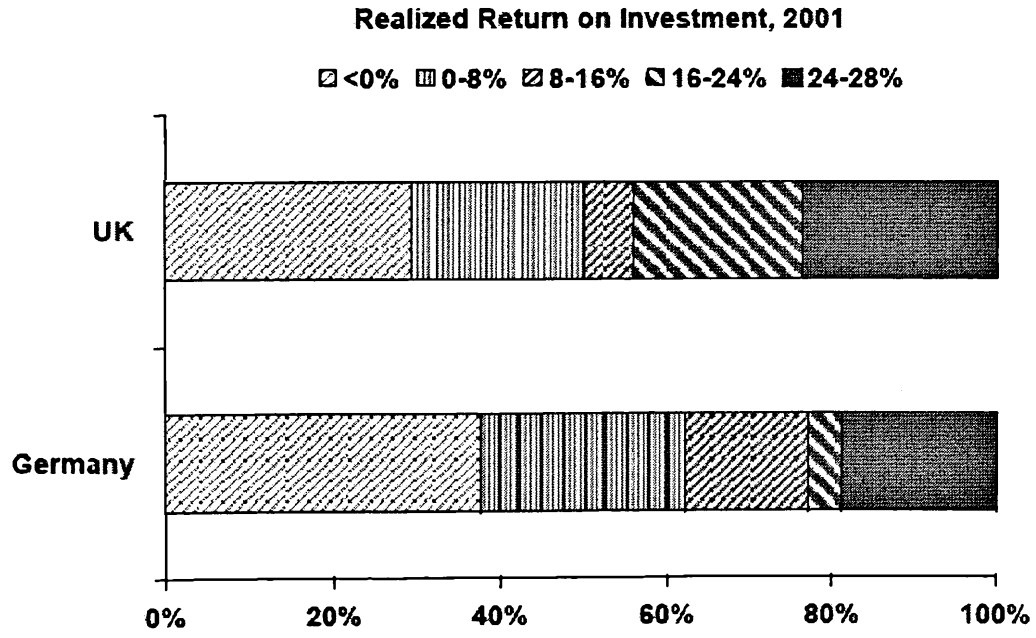
Source: Own Survey

The difference in the perception of investment barriers between both countries is small for 'Low deal flow' and 'Lack of proposals with promising returns'. In both countries three constraints are regarded the most important, although not in the same order. These are 'Lack of proposals with promising returns', 'Perceived risk involved is prohibitively high' and 'Difficulties of exit'. In Britain missing investment opportunities in form of proposals is the single most named factor hinting at constraints on the demand side. In contrast, for German respondents risk is the dominant constraining factor. Interestingly the difference between both countries are most marked for 'Perceived risk involved is prohibitively high' and 'Difficulties in monitoring investee companies'. The first

difference may simply reflect different notions about risky market environments in both countries and as such reflect different ways of how "markets" are organized and constructed in Germany. Part B of the questionnaire analyses the investment behaviour of venture capital and private equity companies. There are marked differences in both countries with regard to the expected rate of return (question B12) and the realised return on investment in 2001 (question B13, see figure 4.2). A clear statement can be made: In comparison to Germany, UK companies target and realise higher return rates. These differences may partly reflect the impact of policy initiatives in both countries (see section 4.3).

Figure 4.2: Expected Minimum and Realised Rate of Return in 2001





Source: Own Survey

4.2.3 The Perceptions of a 'Normative' Equity Gap

Since policies to promote the venture capital industry are in place, a correct perception of a 'positive' equity gap is difficult to measure and the wording of the question would have to assume far-reaching analytical skills of the respondents. However, a question in the policy section of the questionnaire refers to the perception of 'normative' equity gaps and asks, in which regions, phases, segments, the respondents see a special need for public finance (see table 4.12; question D8).

Table 4.12: Market Categories and the Perception of a Need for Public Finance

Categories	Germany (N=104)			UK (N=57)		
	rank	percentage	number	rank	percentage	number
Business stage	1	72.1 (61.5)	64	1	45.6 (66.7)	38
Sectors	4	37.5 (50.0)	52	4	28.1 (36.8)	21
Company size (sales)	2	64.4 (43.3)	45	2	31.6 (35.1)	20
Region	3	54.8 (28.8)	30	2	31.6 (15.8)	9

Source: Own Survey; Note: The Numbers in Brackets Represent the Previous Findings about the Gap Perceptions; Deal Size Segments Were not Offered for a Potential Answer in this Question

Interestingly, in the UK this perception of a gap is smaller in comparison to the previous positive one for all categories except for regions. In contrast only the perception of a sector gap is smaller in Germany. The increase for regions is also the largest. At least with regard to 'normative' equity gaps respondents are much more aware of regional issues. The other differences for the UK suggest that many respondents perceive that there are, or would be 'positive' equity gaps without the rather small and few public programmes. Nevertheless they do not perceive a need for policy intervention in the sense of 'normative' gaps, since they believe that transaction cost are genuine, government programmes are inefficient or lead to overinvestment despite potential positive spill-over effects to the economy. Although the view that public venture capital programmes should be stopped, because they "are inefficient and/or support inefficient venture capital companies", had the lowest importance to 'improving' policies in both

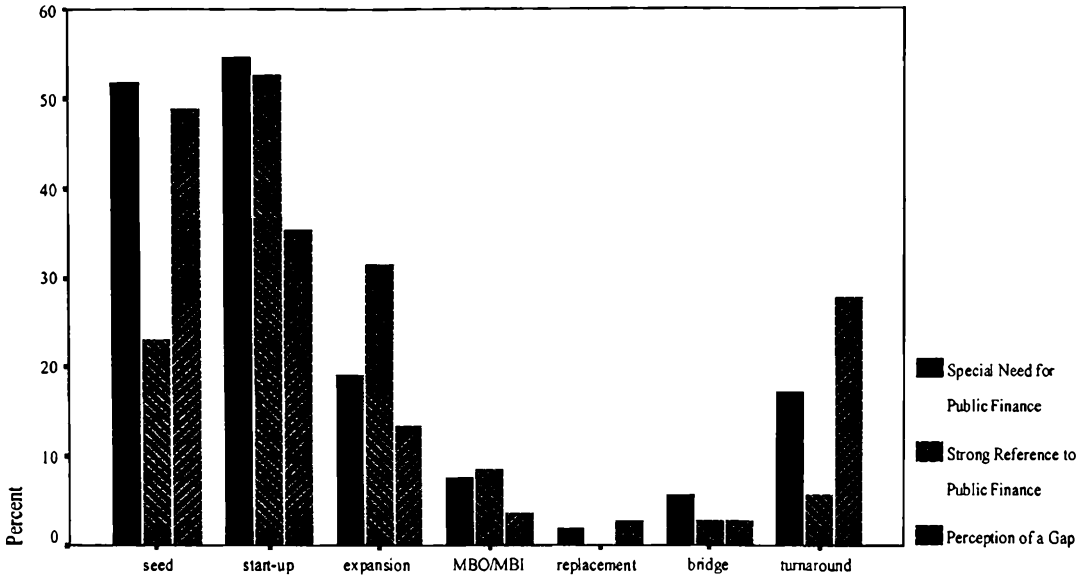
countries (Germany: Ø 4.95, N=76). UK: Ø 4.19, N=27), a different picture appears for Germany. Most pronounced is the view of the Mittelständische Beteiligungsgesellschaften (MBGs, public regional institutions). They clearly see a special need for public finance, since all of these respondents ticked at least one segment of question D8, but they may perceive this need to be covered by their activity or other existing initiatives.[1] Only 50 percents of them answered in C1 that gaps exist (N=10). Other public or semi public institutions and independent venture capital also perceive a higher need, the exception is corporate venture capital companies, mirroring an attitude similar to the UK.

The following figures provide a detailed overview of the market segments with regard to the special need for public finance, the strong reference to public finance and the perception of a gap (Germany: N=104, UK: N=57). In Germany the normative gap perception in general scores higher results than the positive gap perception which indicates a sufficient coverage of public programmes. This argument is supported by the opposite relation between need and gap perception for the business stage 'replacement', where no respondent referred to public finance and for 'turnaround', where hardly any respondent referred to public finance. Furthermore, this opposite relation also shows in the sector 'manufacturing, low tech ('old economy')', where initiatives are currently designed. Similar to many market segments in the UK (with the exception of the 'life science' sector) these are segments for which no government programmes are in place. Hence, any gap perception in C2 must here at least be according to the definition of a 'positive' equity gap, which is only a necessary, but not a sufficient condition for a 'normative' gap and the need for public finance. However, since subsidies supporting the economy are at least always welcome for those who benefit, German companies may simply acknowledge and seek the supportive function of government programmes or public private partnerships, and may not base their view on a rational analysis as to, whether funding gaps exist and whether and how they should be tackled, with the result that the need for public finance becomes exaggerated. In contrast a funding gap debate has been going on for decades in the UK and has been based on arguments of economic

[1] For the German gap perception in C1 and the need for public finance according to the type or size of the company and stage specialization see KfW 2003.

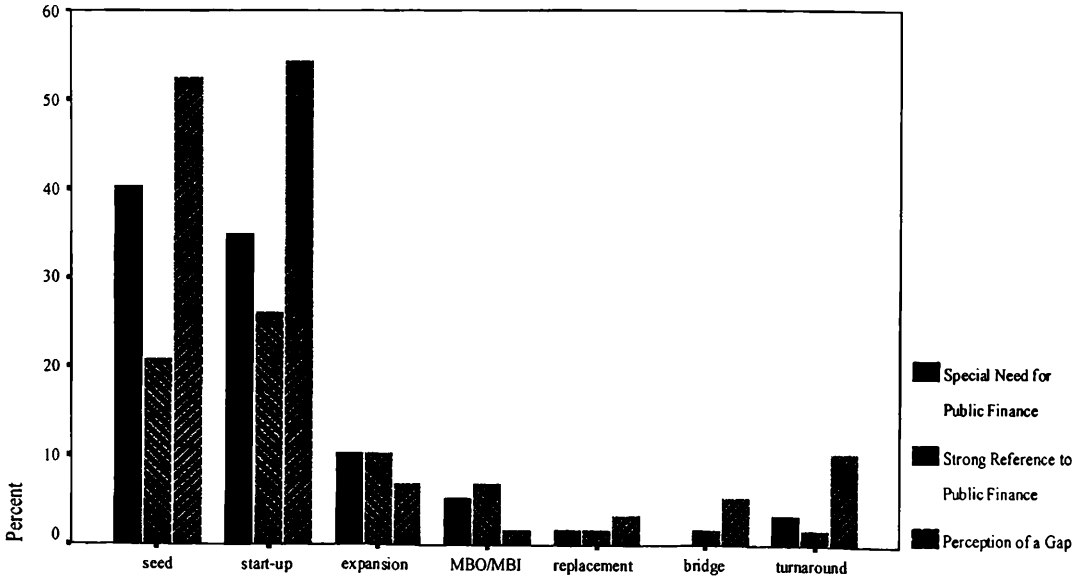
theory. Yet, even in the UK, peripheral regions mirror the general German relationship between the gap and need perception. This indicates that at least some of the respondents in the UK favour regional re-distributional aims over the overall efficiency of the national economy, which many of the German respondents also do.

Figure 4.3: Special Need for Public Finance, Strong Reference to Public Finance and the Perception of a Gap with Regard to Business Stages in Germany



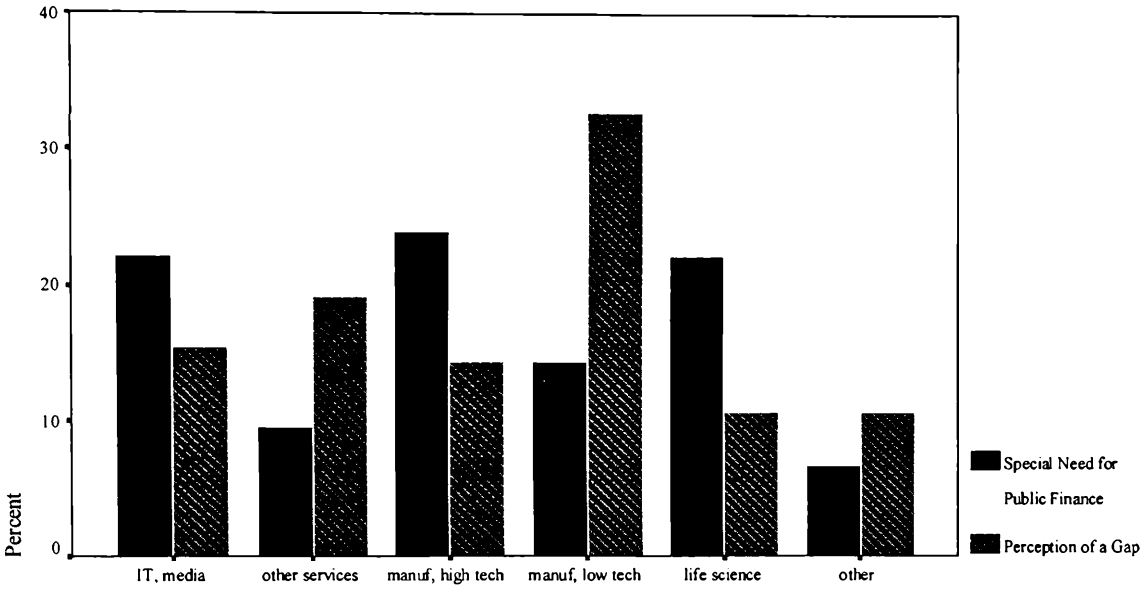
Source: Own Survey

Figure 4.4: Special Need for Public Finance, Strong Reference to Public Finance and the Perception of a Gap with Regard to Business Stages in the UK



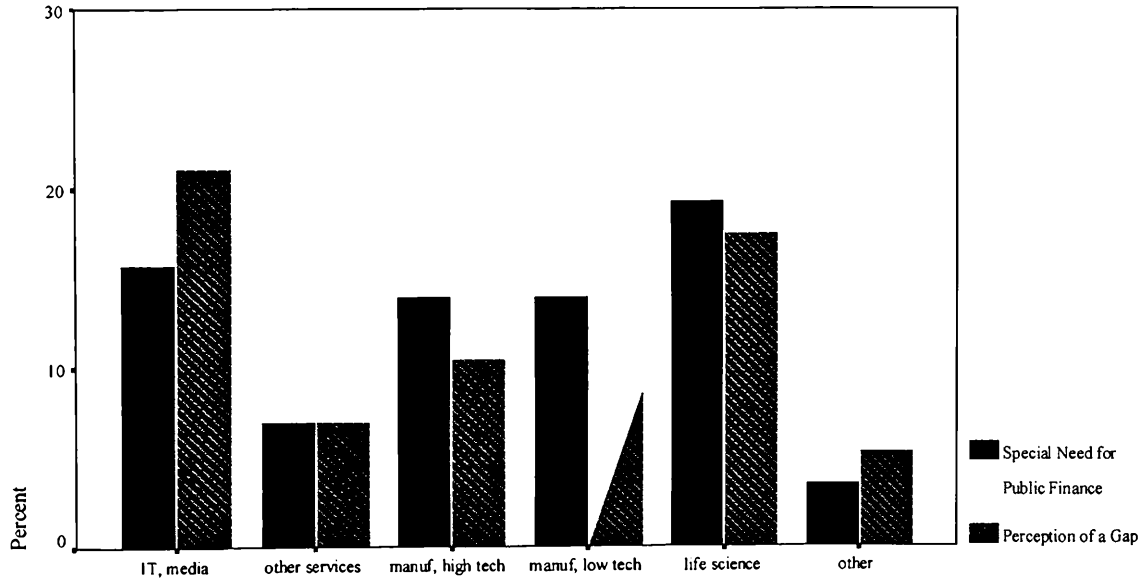
Source: Own Survey

Figure 4.5: Special Need for Public Finance and the Perception of a Gap with Regard to Sectors in Germany



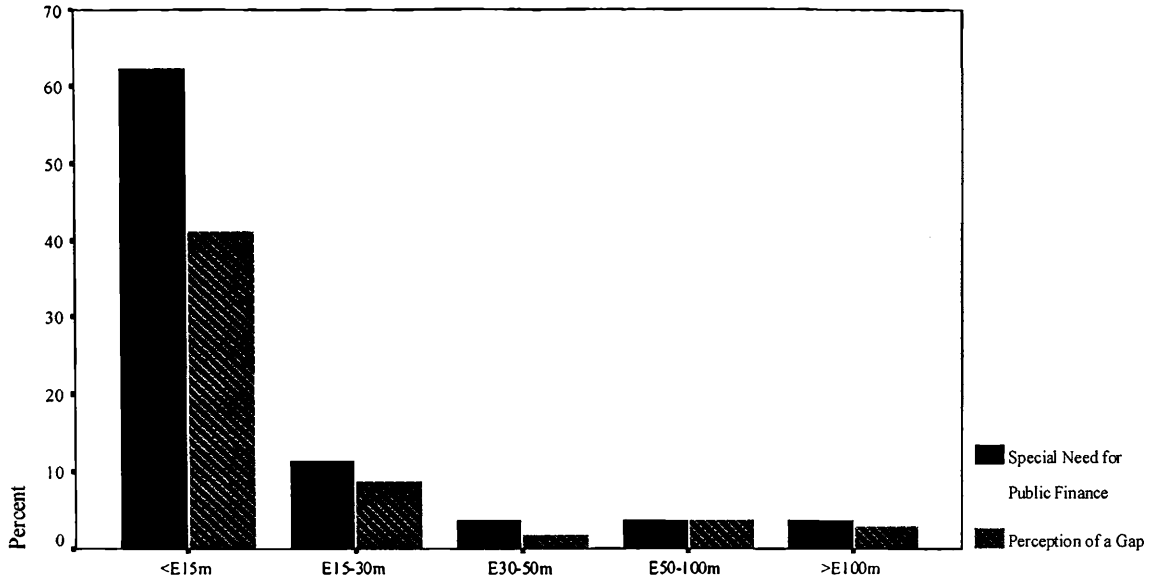
Source: Own Survey

Figure 4.6: Special Need for Public Finance and the Perception of a Gap with Regard to Sectors in the UK



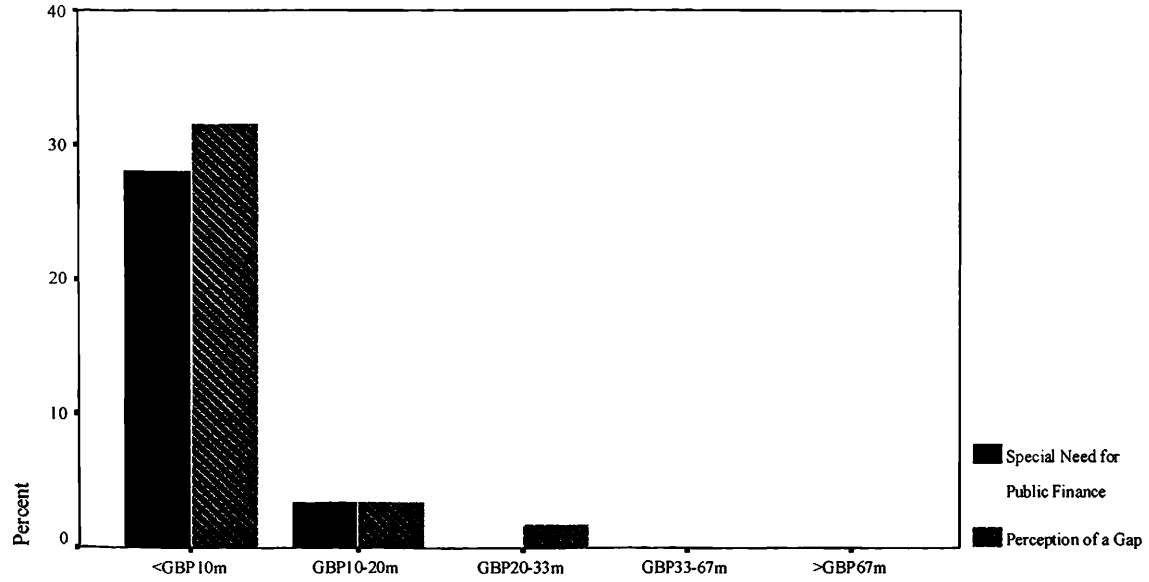
Source: Own Survey

Figure 4.7: Special Need for Public Finance and the Perception of a Gap with Regard to the Size of the Investee Company (Sales) in Germany



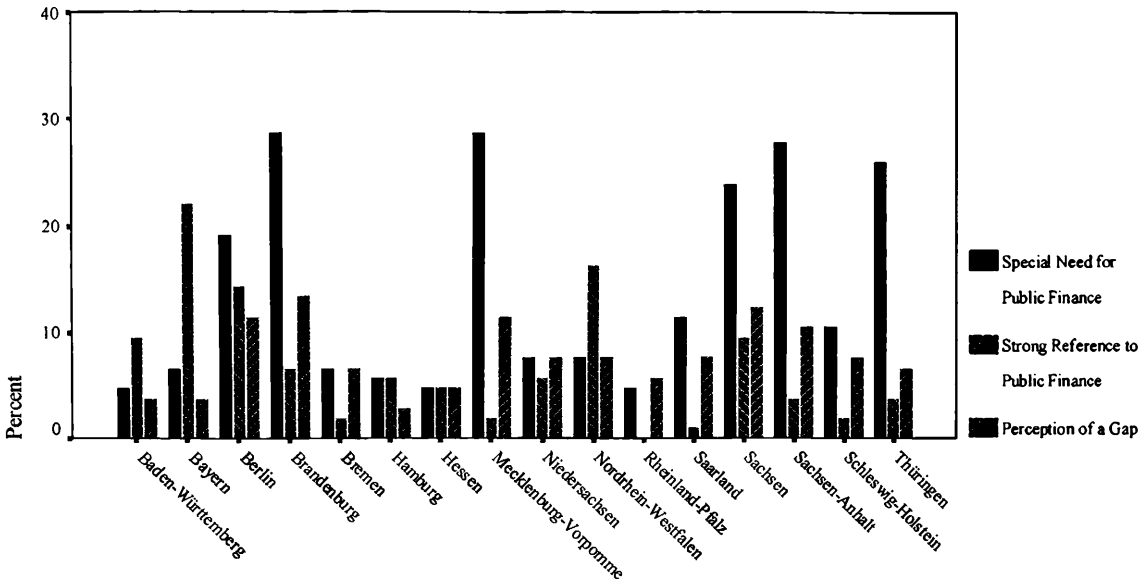
Source: Own Survey

Figure 4.8: Special Need for Public Finance and the Perception of a Gap with Regard to the Size of the Investee Company (Sales) in the UK



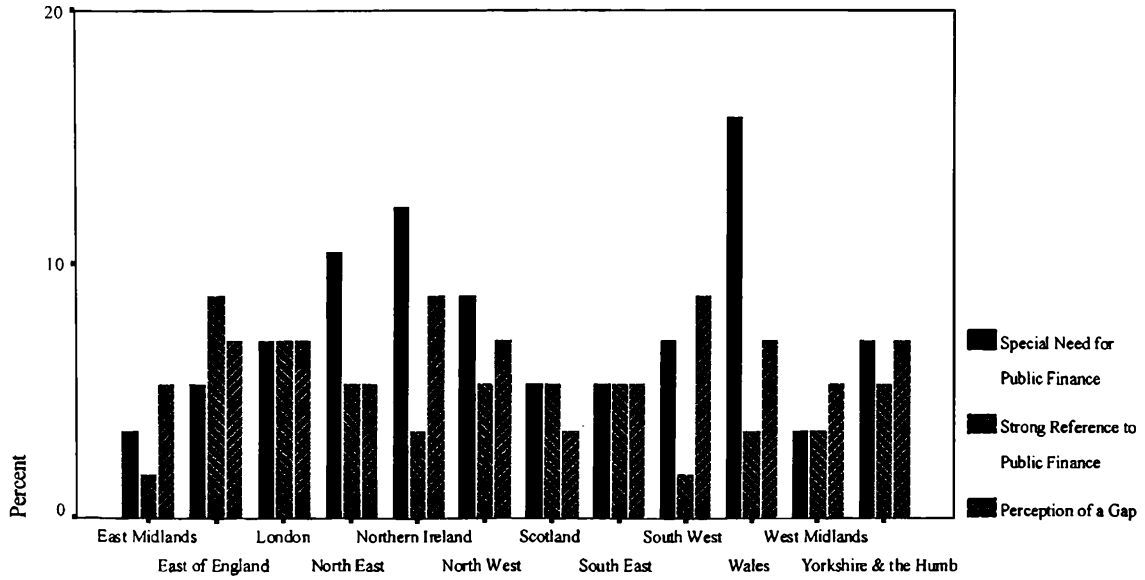
Source: Own Survey

Figure 4.9: Special Need for Public Finance, Strong Reference to Public Finance and the Perception of a Gap with Regard to Regions in Germany



Source: Own Survey

Figure 4.10: Special Need for Public Finance, Strong Reference to Public Finance and the Perception of a Gap with Regard to Regions in the UK



Source: Own Survey

4.3 POLICIES TO CLOSE A 'GAP'

Over the past twenty-five years, the USA has pioneered a new technological revolution based on large numbers of new small enterprises. The new industries require significant external finance, and the majority of these businesses in the US raise their initial finance from venture capitalists and other similar providers of 'risk money' (such as business angels and corporate venturing), rather than from banks. The European Union, meanwhile, has lagged behind in the growth of 'new economy' high-tech activity, and, compared to the US, innovative small and medium enterprises appear to find it more difficult to get started and grow (Gill et al 2000). Although there has been some debate over whether this is because Europe lacks an individualistic entrepreneurial culture of the sort that seems to characterise the US, the dominant view is that it is due to the nature of capital markets and the problems of raising finance for small risky businesses. Across much of Europe, regional and local banks have traditionally been important sources of capital for small and medium enterprises (SMEs), but it has been increasingly argued that this source of external funding has deprived European entrepreneurs of sufficient risk capital.

Accordingly, the European Commission has become increasingly exercised over what it sees as the need to develop large and pro-active venture capital and risk capital markets across the EU. "Developing risk capital in the European Union, leading towards the development of pan-European risk capital markets is essential for job creation in the EU... In essence what is at stake is the creation of a new entrepreneurial culture in Europe. The real political challenge is to provide the tools for enabling technologies and financial instruments for a new generation of European entrepreneurs to start up and succeed...The Commission considers the provision of substantial pan-European risk capital markets a necessary condition for this to happen" (European Commission 1998: 1). The task is to remove and dismantle the institutional and market barriers that exist in European financial systems so as to promote the growth of large and vibrant venture capital funds as well as suitable stock market exit routes by which successful businesses can be floated and additional liquidity raised (Wright et al 1999; Mason/Harrison 1999; Leadbeater 2000).

By comparison with the USA, venture capitalism in Europe is indeed underdeveloped. Throughout the 1980s and into the first half of the 1990s, the annual volume of venture capital investment averaged less than €5bn.[1] It has only been since 1996 that the size of the market has grown, to €35bn in 2000, though with the sharp collapse of 'new economy' stocks and resultant economic slowdown from late 2000 onwards, the volume of new investment fell back in 2001 to €24bn. This compares with some $23bn of venture capital investment in the US in 1998, and over $100bn in 2000.[2] It is widely argued that the slower development of venture capital across the EU, compared to the USA, reflects a variety of institutional and market factors that, in combination, tend to militate against a vibrant supply of risk capital (Wright et al 1999; Cowie 1999).

One of the main factors explaining the immaturity of many European venture markets is the influence of traditional attitudes to firm ownership and related systems of firm finance. Historically, many firms across Europe have been family owned and financially independent, and most have preferred bank loans to equity finance. Searching for equity capital has been seen potentially damaging to a firm's reputation. More generally, it has also been argued that European entrepreneurs themselves suffer from a relatively low social status. Although this image does appear to be changing, bankruptcy in many European states remains tainted with stigma and failure, whereas in the USA it is much less disparaged (De Witte 1999).

Some researchers have argued that globalization and integration are at last undermining such traditional financial patterns and preferences in the EU (Turner 2001; Harding/Paterson 2000). In the context of intensified competition, many SMEs are recognizing the benefits of outside expert help and advice from experienced partners, as well as the potential of equity finance in meeting expensive innovation and investment needs. Consequently, owner-managers are shedding their reluctance to accept equity and institutional partners.

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[1] Europe here refers to the 15 member states of the European Union plus Switzerland.
[2] Funding for MBOs, MBIs and LBOs is included in the figures for Europe, but excluded from those for the USA.

A second problem is the lack of active stock markets in many European countries. Well-developed stock markets are considered important to the existence of a vibrant venture capital market, as many venture capitalists seek an exit route via an initial public offering or IPO (Black/Gibson 1998). Typically, venture capitalists look to dispose of at least half of their investments in a five to ten year period. The existence of readily accessible stock markets and high stock market values should therefore encourage more venture capital investment. In the past, European stock markets have been too small and fragmented to provide the necessary liquidity. Between 1992 and 1997 there were 1,200 venture backed IPOs in the US, compared to 244 in the UK and only 156 in the rest of Europe. Before the 1980s, SMEs in particular had difficulty obtaining equity finance because there were few 'second tier' equity markets, and the 'first tier' markets had over-demanding listing requirements. The situation has been improved in recent years by the creation of 'second tier' stock markets for high-growth small firms, such as the UK's AIM in 1995, the French Nouveau Marché in 1996, Frankfurt's Neuer Markt in 1997, and Milan's Nuovo Mercato in 1999.

Nevertheless, compared to the USA, the European market appears fragmented, institutionally and geographically. For example, as of early-2000 there were still 33 regulated stock markets and 18 associated regulatory bodies in the EU. Attempts to reduce this fragmentation have yet to make a major impact. The creation of EASDAQ in 1996 was intended to remedy the lack of a pan-European market for raising liquidity for small, high-technology enterprises, in the same way that NASDAQ in the US has played a key role in financing the wave of fast-growing American high-tech companies in the 1990s (OECD 1996; Cowie 1999). The creation of EASDAQ was designed to imitate this success, but it has thus far failed to attract large numbers of European entrepreneurs (Bank of England 2001). Similarly, the creation of Euro NM by an agreement between the Paris, Brussels, Frankfurt, Amsterdam and Milan Stock Exchanges was intended to promote the cross-listing and trading of their members. Its capitalization has grown quite rapidly in recent years. However, the bursting of the dotcom bubble in 2000-2001 has both reduced stock market values and the level of IPO activity. Trade sales continue to be the main exit route in the European venture capital market.

Thirdly, it is also beyond doubt that the complex fiscal and regulatory contexts of many European states have stifled the demand for and the supply of venture capital (European Commission 1998; Bannock Consulting 2001). In several states, high capital gains and equity taxes, as well as complex company laws, act as obstacles to equity trading and buy-out activity. At the same time, fragmented patent laws, bankruptcy laws and demanding company registration procedures have all limited the demand for venture capital. Over the course of the 1990s, many of these regimes began to be reformed and some of the major impediments to venture capital have been lowered, though scope for further reforms undoubtedly exists.

There are, however, also strong grounds for arguing that the supply of venture capital, of itself, does not necessarily create a corresponding demand. What may also be needed are policies to stimulate the demand side – that is the numbers of potential new ventures and start-ups that might benefit from access to venture finance. This is not only a national-level issue (McGlue 2002), but one that has particular relevance at the regional and local level. Venture capital activity in lagging regions may well be primarily constrained by the restricted supply of viable, high-potential businesses. It may be difficult, therefore, for such regions to demonstrate that they have a real existing equity gap. As US experience has shown, simply making venture capital available will not magically generate the conditions under which entrepreneurship can flourish (Florida/Kenney 1988: 316-317).

Another question concerns what specific forms policies should take – and whether such policies should be linked to other policies directed at encouraging and facilitating high-technology enterprise. For example, some authors argue that direct supply of capital by public authorities – especially in economically lagging regions - may send perverse signals about commercial returns to private firms, and may also confuse development and commercial criteria in the selection of projects. They argue, therefore, that public agencies are better advised to sponsor and attract privately managed funds through fiscal incentives and investment in these funds (Doran/Bannock, 2000). Following from this, another fundamental issue is whether public policies in fact can have any significant impact on venture capital activity. For example, according to Mason and

Harrison (1999), drawing on UK and US experience, previous attempts by national and local governments to fill regional venture equity gaps have not on the whole proved very impressive. The effect, they suggest, has often been to reinforce existing spatial biases in the venture capital industry. On the other hand, Laughlin and Digirolamo (1994) and Lerner (1999, 2002), have argued that in the US public programs at the Federal, state and city levels have played an important role in the US venture industry, not only providing funds but also filling information gaps and acting in a guarantee and certification capacity.

In response to the conviction that there are significant funding gaps, particularly for small high-technology-based firms, most OECD governments have introduced remedial policies. The OECD (1997) distinguishes between indirect measures, such as stock-market reform, and direct measures that attempt to stimulate and improve venture capital markets. These direct measures can be classified into three types of programmes. The first is the direct supply of capital to venture capital firms (e.g. through refinancing loans) or to small investee firms (via public venture capital firms, often in co-investments schemes). Capital may be supplied either as equity or loans. Second, governments may provide financial incentives for investing in venture capital funds or small firms (for example, through equity and loan guarantees, tax incentives, or by engineering an upside return boost for private investors in public-private funds) which are intended to stimulate private investment. Third, states also directly shape venture capital markets by means of the regulations controlling types of venture capital investors, and may introduce regulatory measures designed to mobilise certain politically desired types of investor, such as pension funds. Given the regional focus of this report, we examine the first two types of intervention as it is these that can be given a strong regional dimension, and that have in fact been widely used in regional initiatives.

These direct measures can be further broken down into seven main types of scheme (Bannock Consulting 2001). First, states may create investment funds or funds of funds in which they are partners, investors or participants. Public investment in such funds often takes a minority share and is on subordinated terms, which means that the state

receives lower returns than other investors and may absorb the initial costs of any losses. Second, wholly or majority publicly-funded agencies may act as direct single investors in small firms. Third, such agencies may instead act as co-investors with private investors that may take the lead in particular projects. Fourth, government agencies may provide refinancing loans to venture capital firms on commercial or softer terms, typically for investments in specific types of enterprise. Fifth, such measures may also be combined with different forms of guarantees against a proportion of investment losses, as well as loan repayment forgiveness. Such guarantees are usually given to venture capital firms, although they may also be given to those financial institutions investing in venture capital funds. Guarantees and loan forgiveness may also be accompanied by upside return boosts, which increase the incentives for investments in risk capital. Sixth, overhead subsidies can be used to cover part of the costs of venture capital firms. And, finally, tax regulations and fiscal incentives can be used to encourage investors to undertake risk capital investments. In summary then, there are a wide range of possible ways in which states can act to modify the operations of venture capital markets, and different tools can be applied to different parts of the investment process. Furthermore these instruments are frequently combined to produce quite complex policy measures.

There are several reasons for a comparison between the UK and Germany. First, although the UK venture capital market is more mature and considerably larger than that in Germany – in 2001 the funds raised for investment in the UK amounted to €17.66bn, compared to €6.11bn in Germany (European Venture Capital Association 2002) – funds in Germany have been much more directed at start-up and early-stage investment than has been the case in the UK, where the focus has been overwhelmingly on MBOs, MBIs and LBOs (Martin/Sunley/Turner 2001). Perhaps because of the latter that there has been a recurring debate in the UK over what is perceived as an 'equity gap' at the small deal size, start-up and high technology (or so-called 'classic') sectors of the venture capital market. In Germany, in contrast, although the initial motivation for state intervention in the venture capital market was for foundation, high-technology ventures, the complaint is now more one of a lack of equity capital for 'old economy' activities. Second, the nature of the industry in the two countries differs in significant

and interesting ways. For one thing, the financial, institutional and regulatory framework impinging upon the venture capital industry differs. Perhaps most importantly, in the bank based financial system in Germany two quasi-public credit institutions employed historically to provide long-term financing to industry – the Kreditanstalt für Wiederaufbau (KfW) and Deutsche Ausgleichsbank (DtA) - have become active players in channelling public funds for venture capital investment. Until recently, the only institution of a public nature that operated in the venture capital market in the UK was 3i (previously Investors in Industry), a body owned jointly by the Bank of England and the major clearing banks and which invested directly in venture equity. This institution was privatised and floated during the 1990s. Then in 2000, the UK government launched a major new policy initiative – the Regional Venture Capital Funds (RVCFs) – aimed at creating specific funds in the English Regional Development Agency areas directed explicitly at the lower deal-size end of the market. The aim behind these RVCFs is to commit state monies to leverage additional private funds to establish one-off regional 'funds of funds' under the control of a single fund manager. This approach thus differs from that found in Germany as embodied in the KfW and DtA, which is essentially a continuous 'open-ended' system of support. Third, the nature of venture capital investments differs markedly between the two countries, in that, at least until very recently, the UK market has been overwhelmingly orientated to management buy-outs (MBOs), to the neglect of start-up financing. This focus on MBO/MBI investment and the neglect of 'classic' venture capital activity (that is seed, start-up and early stage ventures, especially in high-tech companies) has in fact been a recurrent criticism of the UK market. And the relative lack of funds directed into the start-up and early-stage stages was a key factor in the UK government's decision to set up the new Regional Venture Capital Funds. In Germany, by contrast, since the mid-1990s, foundation and early-stage venture capital - especially in high-tech sectors - has been much stronger, and investment in MBOs and MBIs much less significant, than in the UK. Fourth, there are important differences between the two countries in the geographical organisation of the industry. In the UK, the venture capital industry is much more spatially concentrated – primarily in London - than is the case in Germany, where there is a higher degree of regional balance, with no one single centre or region

dominating the market in the same way that London and the South East region do in the UK.

Both countries differ from one another not only in the size and maturity of their venture capital markets, but also in the extent and nature of their institutional set-ups and policy interventions. Distinctive institutional environments and different aims have shaped the instruments and mechanisms used. In Germany, the prevalence of public and semi-public actors and the dominance of public financial support, (especially via the programmes of the KfW and tbg), virtually created a venture capital industry from scratch during the 1990s. The reliance on guarantees and on the supply of capital via refinancing loans and silent capital co-investment stems from the traditional means of providing SME support through loans and guarantees. Guarantees appear to have had a particularly strong impact in encouraging investments and their extensive use helped to leverage in a large amount of private investment (see table 4.13). However, the recent 'technology crash' resulted in large guarantee pay-outs and the costs have increased to an extent that the programmes are unlikely to continue in their present form. Yet, risk mitigation schemes form an in-build stabilizer for venture capital companies. Since especially the venture capital industry is prone to the business cycle and the valuation of the stock market, guarantees may help to keep talent and competence on board during a severe downswing phase of the market. A restricted, reasonable use of this instrument should also not hinder a necessary cleaning-up of the market.

Both countries had to pass EU regulations with regard to state aid, which were negotiated at the same time. Since the market values of the public guarantees are difficult to quantify and the private capital markets hardly offer any guarantees of this form, the large take-up by investors and low fees suggest that they represented an enormous amount of state aid. The EU, however, acknowledged the important role of start-up finance for the economic development of the union, recognised a role for public funding limited to "addressing identifiable market failures" and supported the industry with EIF fund of funds (European Commission 2001b). With regard to a departure from common state aid rules and rapid developments in this area, the European Commission reserved the right to change these rules, that were envisaged to be applied for five years,

at any time (European Commission 2001a). An agreement, which permitted the German governments to retain support programmes in their present form with the exceptions that public guarantees for state banks had to be abolished in 2005 and that export finance subsidies had to be diverted from KfW to a different organisation, was hence fragile.[1] Yet, due to the high cost of the guarantee programmes in recent years and the opportunity to tap into European funds available, a policy switch towards fund of fund constructions had already begun.

Based on the survey results the following table measures the effectiveness of applied policy instruments in both countries. It is directly related to the policy target of closing a gap since it refers to investment that otherwise would not have occurred.

Table 4.13: Aspects of Public Programmes that Caused Additional Investments

Aspect	Germany			UK		
	rank	Ø	N	rank	Ø	N
risk mitigation (guarantees)	1	2.32	96	3	5.19	21
cheaper refinancing loans	2	3.77	94	4	5.55	22
public co-investment in investee companies	3	3.80	94	2	4.91	22
public co-investment in fund	4	4.30	93	1	4.13	23
access to (not price reduced) refinancing loans	5	4.33	90	5	5.62	21

Source: Own Survey; Note: Valid Average Ø, Scale from 1 to 6, 1= very important, 6= not important[2]

[1] "Die inländische Fördertätigkeit bleibt also uneingeschränkt bestehen. Sie wurde von der EU-Kommission als Ausgleich für die Staatsgarantie anerkannt" (Süddeutsche Zeitung 2002, Schlusspunkt im Bankenstreit, KfW trifft Vereinbarung mit Brüssel, Inländische Förderprogramme bleiben unangetastet/Exportfinanzierung wird ausgelagert)

[2] To complete the results: In Germany 'others' mean is 1.00 (N=4), in the UK 'others' mean is 2.00 (N=3), however, the specified answers were in both countries not coherent at all. Interestingly the UK standard deviation for 'public co-investment in fund' is with 2.262 by far the highest, expressing a split opinion on the use and the effectiveness of this instrument.

4.3.1 The Evolution of Venture Capital Policy in Germany

Venture capital and private equity policies in Germany have developed as part of both technology-and-innovation (T&I), and small-and–medium-sized-enterprise (SME) policies. The provision of equity capital emerged as a major focus during the 1990s and has since become a regular feature of German T&I programmes, and increasingly of SME policy.[1] The key instruments are guarantees, refinancing loans and direct investment by wholly or majority publicly-funded agencies, especially as co-investment and in the form of 'silent capital'.

Venture capital programmes complement and are combined with a wide array of other instruments, such as grant and loan schemes as well as non-financial instruments such as consultancy and network support services, small firm incubators, and technology transfer. The rationale behind venture capital policies and its specific forms are best understood in the context of the development of SME and T&I policy.

Small and medium sized enterprises (SMEs), often referred to as 'Mittelstand' in Germany, have long been considered the backbone of the German economy, and since World War II a complex and complicated system of SME and especially start-up support policies has developed. Traditional SME policies including early support schemes for technology based and innovative SMEs were largely based on grants and loans at preferential rates. In the 1960s and 1970s the T&I policy focus was on financing large research institutions and research in large industrial companies, and SMEs as potential carriers of innovation processes have only been targeted since the 1980s. Since the 1980s and especially the 1990s, these have been complemented by consultancy services and network initiatives, mainly provided to start-ups and SMEs in specific situations. Although the first equity programme was introduced in the 1970s, it was only in the late-1990s that the provision of equity to SMEs became a major policy aim. In reaction to a debate about a possible equity gap for SMEs in the late-1960s, the ERP venture capital programme (ERP-Beteiligungsprogramm) was launched by the KfW in 1971. This programme aimed to refinance those venture capital firms providing

[1] For an overview on the development of T&I policies in Germany, see Fier and Harhoff (2001).

quasi-equity to SMEs unsuited for the stock market (now described as 'old-economy' SMEs). It led to the establishment of the Mittelständische Beteiligungsgesellschaften (MBGs) in the German Länder. This is mainly due a growing awareness of the advantages and potentials of venture capital finance for technology-based and innovative firms, the restrictions placed on bank debt financing by Basel II, and the increasing significance of succession problems for SMEs. Following a draft version in July 1999, the Basler Ausschuss für Bankenaufsicht has laid down new regulations regarding the adequate equity capitalisation of banks. These regulations revise stipulations made in 1988 (Basel I). It is widely argued that following Basel II, banks will charge higher costs to more risky investments, as they will be required to provide more security for risky credits, and rating will play a more prominent role. Although Basel II will only come into effect in 2006, banks have already started to change their strategies accordingly.

The national pilot scheme 'Equity for young technology-based firms' (BJTU), launched in 1989, was the first equity programme in Germany T&I policy and marked the beginning of the recent upsurge of venture capital policies in Germany. One earlier endeavour in the 1970s, however, should not be ignored. As a response to public debates about an equity and a technology-market gap the Deutsche Wagnisfinanzierungsgesellschaft mbH (WFG) was established as the first German private equity firm by the national government and 29 banks in 1975. This venture proved to be an outright failure – among the reasons cited are the contradictory goals of the shareholders - and the government withdrew in 1984 (Mayer/Müller 1991; Becker/Hellmann 2000). The new programme, however, was inspired by a desire to imitate the success of the US in developing venture capital-supported technology-based companies and was referred to as a "technology policy learning and stimulation programme" (Kulicke 1997a: 116). It provided (non-fiscal) incentives to encourage investors to invest in young technology-based firms. By aiming to stimulate private capital providers and activate market forces, it marked a clear shift from loan- and grant-based schemes, such as the preceding pilot programme, 'Support for technology-oriented business startups' (TOU, 1983-1988), to a more market based approach in T&I policy.

The BJTU programme (1989-1994), and its successor programme 'Equity for small technology-based firms' (BTU, which started in 1995), in combination with other more recent equity programmes, have had a substantial impact on the German venture capital market. They have led to the establishment of new venture capital firms concentrating on early-stage (technology) finance and a reorientation of pre-existing venture capital firms (Wupperfeld, 1997). These policies are one reason why Germany, in international comparative terms, has large absolute amounts and high shares of venture capital in early-stage investments. It is estimated that the majority of all early-stage investments in young or small technology-based firms in Germany in the 1990s were publicly supported in some way.

The take-off in the German venture capital/private equity market in the second half of the 1990s was supported by new venture capital and private equity policies at both national and regional levels (Fiedler/Hellmann 2001). Some of the more recent programmes support investment in later stages and apply a broader definition of target companies including medium sized and more established companies as well as firms without a specific technology or innovation focus.

In addition to the proliferation of straightforward venture capital policies targeting individual firms, more complex T&I policies have been launched since the mid-1990s. These policies combine various instruments and address specific groups of actors (such as support for the creation of innovation networks). Equity capital and equity providers, especially venture capital firms, constitute one element of these policies. In the belief that localised clusters are essential for the generation of innovation, relevant national policies were designed as 'contests between regions' (for example, the BioRegio contest, launched in 1995). By tying technology policy initiatives to the regional level and moving away from the traditional policy focus on individual firms and sectors, they represented "a new path in technology funding" (Dohse 2001: 446). As T&I policies have become 'regionalized', they have at the same time introduced a (regional) competitive element into the system (Koschatzky et al. 2000: 415). However, the regionalization of T&I policies has only partly been accompanied by the establishment of genuinely regional venture capital policies.

In Germany, long-standing national public institutions, in particular the Kreditanstalt für Wiederaufbau (KfW) and the Deutsche Ausgleichsbank (DtA), or rather its subsidiaries Technologie-Beteiligungs-Gesellschaft mbH (tbg) and gbb Beteiligungs-AG, of which the latter solely provides equity to low- and no-tech, 'old economy' firms with limited growth prospects, play a crucial role within public venture capital. They have operated loan- and grant-oriented policies for a long time and have, in the last decade, also become engaged in venture capital policies. The KfW and DtA, as well as similar institutions at the Länder level, form a tiered system of quasi-public banks acting as economic development agencies in charge of SME and T&I programmes. The complexity of German SME and T&I policies targeting start-ups in Germany partly results from the incremental development of programmes within and in co-operation with these public institutions. Hannemann and Schmeisser (2001) for example counted no fewer than 186 national and 822 regional public programmes Against the background of this very distinct institutional environment, which reflects the bank-dominated financial system in Germany, it is not surprising that venture capital policy measures show an affinity with, and some similarities to, loan-oriented programmes.

At the national level loan- and equity-oriented programmes within SME and T&I policies were mainly administered by two large quasi-public banks, the Kreditanstalt für Wiederaufbau in Frankfurt (KfW), on the one hand, and the Deutsche Ausgleichsbank in Bonn (DtA), on the other. The KfW and DtA acted as "Wirtschaftsförderinstitute", that is, economic development institutions. Founded in the wake of World War II and capitalised under the post-war European Recovery Program (ERP), both institutions were originally assigned to tasks related to the reconstruction of the German economy and to payment transfers after the war. Subsequently they have evolved into national economic development institutions with a variety of tasks including the management of SME and T&I programmes. Recently DtA was merged with KfW. At the regional level the (semi-)public Landesbanken and – as integrated or separate institutions – public Investitionsbanken play a similar role. They act as regional economic development banks and manage regional SME and T&I policies. While these institutions are vehicles administering Federal Government-initiated programmes in a top-down manner, they

also have developed their own initiatives and actively participate in the design and introduction of new policies.

The two models applied in the first national venture capital programme, the BJTU pilot scheme and continued in the current BTU programme, are representative of the types of programmes managed by KfW and tbg. The KfW model combines refinancing loans with public guarantees, while the tbg model combines a public-sector co-investment scheme with guarantees. KfW and tbg programmes played an important role in the boom of the German venture capital market in the late-1990s, when they accounted for a significant share of venture capital invested. In the second half of the 1990s a large part of total investment and the majority of all seed, start-up and expansion investment (which is the main focus of KfW and tbg programmes) were either refinanced or co-financed by the KfW and the tbg respectively.

The KfW provides various refinancing facilities (long-term loans of up to 85 % of an investment), investment guarantee schemes and combinations thereof to venture capital firms and other investors that provide equity capital to eligible firms. The loans carry interest rates which are set at the lower end of market rates and are fixed over the duration of the loan. The tbg was founded as a venture capital subsidiary of the DtA in 1989 and directly provides quasi-equity to firms under closely specified conditions. The most important condition is the commitment of a lead investor whose investment is matched by the tbg. Depending on the specific programme, the tbg can guarantee part of the lead investor's investment, and offer rather favourable regulations for the lead investor with regard to the conditions under which he or she can buy out the tbg's share or sell his or her share to the tbg. Both the KfW and tbg mainly act on a case-by-case basis. Recently, however, they have also started sponsoring venture capital/private equity funds using their respective models; these include several regional funds.10 Both models (refinancing and co-investment) increase the amount of investment capital in the venture capital market and at the same time guarantee (part of) the investment of their counterpart (venture capital firm or investor). Venture capital firms and investors using KfW or tbg programmes need to be accredited with the respective institution. The affiliation of the two models with different institutions has led to some competition and

overlap. The most recent decision to merge KfW and tbg's parent company DtA and then concentrate SME support policies in a so-called "SME Bank" (Mittelstandsbank) under the roof of the KfW Group aims at enhancing efficiency and transparency of public policies administered by the two institutions.

The partly pro-cyclical tendency of venture capital support by the KfW and tbg is eminent (Martin et al 2003: 23). Not only have both institutions decreased their commitments in absolute terms, but they have done so at a faster rate than the overall decline in total venture capital investment. While in 1998 almost half of all venture capital investment was sponsored by either KfW or tbg this figure dropped to less than 20 percent in 2001. According to information gathered in interviews, both institutions have become reluctant to sponsor new deals and are concentrating on providing second round finance for existing companies.

The programmes of the KfW and tbg account for the vast majority of financial expenditure and organisational capacity of German venture capital policies at the national level. Nevertheless, there are some further activities including: The close interplay between new T&I policies such as BioRegio and venture capital markets. One dimension of BioRegio was the supply of matching funds to those venture capital firms investing in target companies. Koschatzky et al. (2000b, 429) argue that the availability of venture capital appears to have improved with BioRegio, as innovative biotech SMEs do not identify access to venture capital as a major problem. Several of our interviewees emphasised that policies such as BioRegio and the take-off of the venture capital market are closely intertwined (compare, for instance, the role of BioM AG in Bavaria's biotech cluster). This contrasts markedly with an earlier study of biotechnology SMEs in 1995. The downside of this close interplay is of course the current crisis within high-tech sectors, a crisis which also affects biotechnology and is related to a "dramatic collapse" of venture capital.

The foundation of the Business Angels Netzwerk Deutschland (BAND) by the Federal Government together with business sponsors in 1998, as an initiative to develop an informal venture capital market for early-stage companies. The BAND produces

specimen contracts, a 'How-to-do-book' for business angels and would-be entrepreneurs and runs an internet matching platform. In addition, the activities explicitly support regional business angles initiatives. It is important to note that most KfW and tbg venture capital programmes (with the exception of policies targeting the Eastern Länder, such as FUTOUR) do not have explicit regional objectives; that is, the distribution of the funding is not based on explicit regional criteria. The regional outcomes of KfW and tbg policies, which will be analysed in greater detail in the next chapter, thus mainly depend on factors contextual to the policies themselves. Prominent among these factors are the activities of regional public actors and the way in which they design regional venture capital policies to integrate KfW and tbg funding opportunities.

Venture capital policies at the regional level – with the notable exception of MBGs – are fairly recent and vary significantly in their scale and scope. While some Länder actively intervene in their regional venture capital markets, others are less engaged. There is an apparent variation of policies with regard to aims, actors involved, and the mixture of instruments employed. In addition to initiatives that mainly perform consultancy and networking functions (e.g. business angel networks, WIN in Nordrhein-Westfalen), each Land has developed policies aimed at the financial support of venture capital investment. These can be classified into four general types:

First, all Länder states, except Bremen, have established Mittelständische Beteiligungsgesellschaften (MBGs, or Equity Stock Companies). MBGs were founded as regional development agencies by private regional actors as well as local and regional public banks (Sparkassen, Landesbanken) to provide equity to SMEs in the regions. The larger part of their investments is guaranteed by regional guarantee banks (Bürgschaftsbanken) which exist in all Länder and which in turn receive guarantees from the Länder governments and partly the KfW; the latter two also provide refinancing in some cases. While the original focus of the MBGs was firmly on traditional SMEs, some have recently expanded their scope to support T&I. The level of MBG activity differs substantially between the various Länder. The Baden-Württemberg MBG has always enjoyed a great amount of regional government support

and traditionally is the most active MBG in Germany. Other large and active MBGs include those from Bayern, Hessen, Sachsen, Sachsen-Anhalt and Thüringen (Kulicke 1997b; Wupperfeld 1997). In 2001 about one third of MBG investment was in Baden-Württemberg, more than 20 percent in Bavaria while the other Länder account for less than 10 percent each. Nordrhein-Westfalen represents the lowest end of the activity range. Before 2001 Nordrhein- Westfalen's MBG stopped any engagement in new investment projects and is now merely administrating the remains of its portfolio.

In addition to, or as a substitute for, their participation in MBGs, some Sparkassen – local savings banks – established their own venture capital firms. These venture capital firms established by one or more Sparkassen serve a clientele very similar to that of the MBGs. Although they are not Länder initiatives per se, they are indirectly linked to the Länder level via their association with the (public) Landesbanken which serve as their central banks. The vast majority of the more than 500 Sparkassen in Germany are public institutions at the local level and their activities have traditionally been backed by local and regional public authorities enabling them to get preferential credit rating and thus to provide credit at very competitive rates. They are very important providers of credit to old-economy SMEs and have a local or regional focus. The latter is also the case for most of their venture capital subsidiaries, which focus on the traditional clientele of the respective parent companies – thus complementing their product range with an equity facility. Although overall investment sums as well as most of the individual investments are generally rather small, the importance of venture capital firms established by Sparkassen should not be underestimated. Some studies found that about one fifth of German venture capital firms were established with Sparkassen as major owners (Nolte/Stummer 2000 and 2001), and that most of them are located outside the major agglomeration centres. Nordrhein-Westfalen, where the regional MBG ceased its investment activity, is the Land featuring the by far largest number of venture capital firms established by Sparkassen. Second, in most Länder, in addition to the MBGs new Länder institutions have been established in the 1990s to act as regional venture capital firms with a public majority share. In most cases these take the legal form of a 100 percent subsidiary of the respective Landesbank or its investment branch ('Investitionsbank'), or other regional development agencies (such as in Bavaria). Their

sizes and foci vary between the Länder, but generally these institutions concentrate much more on classic venture capital per se, that is on high technology and innovative enterprises, than the MBGs. The most prominent example is Bayern Kapital Risikokapitalbeteiligungs GmbH, founded in 1995. Other examples include IBB Beteiligungsgesellschaft mbH, founded 1997 in Berlin, and BC Brandenburg Capital GmbH, founded in 2000. In Hamburg and Nordrhein-Westfalen such institutions do not exist.

Third, in addition to public-majority institutions, there are also venture capital firms which were founded by a Land together with private investors and in which the Land only holds a minority share. Examples are Maz Level One and Imtc established in 2000 in Hamburg, a Land where there is no public majority venture capital firms as described above and not even a regional investment bank. Apart from the public minority equity funding, Imtc also receives additional funding for overhead subsidies. The two institutions are very small with regard to their fund volume and act as specialist venture capital firms. They concentrate on seed finance in specific sectors, namely microelectronics, telecommunications and medical technology. The private investors are financial and/or technology based companies and individuals, and they are supposed to function as network partners for the portfolio companies. The newly established institutions can be described as 'cluster breeding facilities' as they are providers of seed finance (including a hands-on monitoring approach) and a network facility at the same time, and target areas where Hamburg is perceived to have specific strengths.

Fourth, some states pursue venture capital policies by providing capital to new funds which target particular types of companies (e.g. innovation, technology, early stage) without establishing new institutions. The provision of capital is often conditional on the investment of additional matching capital by the fund manager, so that there is a leverage effect. The fund managers can be public, private or combinations of the two. They are either assigned the task of fund management directly or are chosen by competitive tendering. Examples include the Innovationsfonds Hamburg/Schleswig-Holstein (1998; DM100m) and the Innovationsfonds Nordrhein-Westfalen (2000; DM200m). Both were established in co-operative efforts by the respective Länder, the

KfW and private venture capital firms. The private venture capital firm(s) match the capital provided by public actors and manage the fund. The Innovationsfonds Berlin (founded in the early 1980s) provides an example of a publicly administered fund where matching private or public capital is sought for on a case-by-case basis. This fourfold categorisation of different forms of intervention provides a foundation for understanding how venture capital policies vary between different Länder.

In Germany regional venture capital policies in typically exhibit diverse and varying levels of institutional thickness or density, together with complex actor constellations and complicated instrument constructions, all of which rule out easy generalizations and comparisons. There are three main aspects connected to the regional variation of German venture capital policies. First, regional venture capital policy development is strongly influenced by the relational networks and knowledge of regional actors, as well as by their past experiences and current interests. Indeed, it is often a direct result of the personal interactions and mutual obligations of actors in various public, semi-public and private institutions. Second, and partly related to this point, the amount of financial resources committed to venture capital policies and programmes at the Länder level vary significantly. One important factor here is the economic and fiscal disparities between the Länder. Third, given the constraints on the availability of financial resources, Länder governments and other regional actors generally try to draw on the resources made available by 'external actors, especially the KfW, the tbg and the EU. The specific requirements associated with these funding opportunities, in combination with the regional actors' networks, create a profound complexity in regional venture capital policies across Germany. In particular, the willingness and capability of public actors to successfully start or support initiatives that integrate other actors and funding opportunities (national, EU, private) is crucial and can make a significant difference. A similar process, although operating on a much smaller scale, has also been apparent in the development of venture capital policy in the UK.

4.3.2 The Evolution of Venture Capital Policy in the United Kingdom

Both the economic and ideological contexts in which policy towards venture capital has developed in the UK, are quite different from those in Germany. In Britain, the problem of capital market failure in the supply of capital to small firms was first identified in the Macmillan Report of 1930. But, given the tendency over the past two decades for UK policy to be strongly influenced by neo-liberal free market economics, and given the maturity and size of the British venture capital market, it is perhaps not surprising that central government policy towards the market has, until very recently, been dominated by an approach that seeks to encourage a healthy supply of equity capital through national fiscal incentives rather than regional or local initiatives and programmes. The Loan Guarantee Scheme introduced in 1981 was a further example of an indirect approach that guaranteed a proportion (70-85%) of bank loans to smaller companies. This did not involve equity. The Business Expansion Scheme, for instance, permitted individuals investing directly in small unquoted companies to claim tax relief at their marginal rate on the amount invested. But while it attracted billions of pounds of investment, much of the money went into property and asset-backed deals rather than small high-risk companies (OECD 1997). The Enterprise Investment Scheme introduced in 1994, continued the same approach and provided a range of tax reliefs to encourage individuals and trustees to acquire shares in small higher risk companies. Furthermore, Venture Capital Trusts (VCTs), established in 1995, are investment trusts specialising in investment in small higher-risk trading companies; VCTs can invest up to £1 million in any one business, and are exempt from corporations tax while their investors are also entitled to significant income tax and capital gains relief. The trusts' average investment per company was £882,000 as at end-1999, and most of their investments were focused at £500,000 upwards (DTI 1999). Their original aim however, has been subverted to a large degree as they have tended to invest as much as legally possible in lower risk asset backed shares (OECD 1997).

Despite central government's traditional preference for fiscal incentives, it would be wrong to believe that the UK has seen no examples of attempts to directly supply equity to small firms. Most notably, in response to perceived shortages in the supply of

investment capital to small firms, in 1945 the Bank of England together with the major national clearing banks established the Industrial and Commercial Finance Corporation or ICFC (Coopey/Clarke 1995). The ICFC created a large and passive portfolio of long-term equity investments in unproven companies and did not rely on public sector assistance nor subsidised credit. After a merger in 1973, ICFC became Finance for Industry which subsequently changed its name to Investors in Industry and then to 3i. The organisation specialised in investing relatively small amounts of capital and became the main equity provider in most of the regions of the UK, moving into venture capital from the late- 1970s onwards. In 1994, however, 3i went public (that is, floated on the Stock Market) and it has subsequently been driven by the need to make returns for its shareholders. It has closed several of its UK regional offices (including those in Leeds, Newcastle, and Edinburgh) and in 1998-99 announced that it was adopting 'loose' minimum deal sizes of £1m for technology deals and £3m for general investments. This regional withdrawal and upward shift in deal size have certainly reinforced the perception among many actors in the industry that there is an equity capital gap for small high-risk companies, although, as we have seen, this remains a controversial issue.

In addition, direct policy measures to increase the supply of venture capital to small high-risk companies have, for some time, been employed at a local and regional level by sub-national and specialist sectoral institutions (Harding 1999). The nationalised steel and coal industries, for example, created Enterprise Groups to encourage new firm formation in order to regenerate those local economies and communities damaged by the decline of these heavy industries (British Steel Enterprise was established in 1975[1], British Coal Enterprise in 1984).

In 1982, in an effort to respond to urban recession and widespread private sector bankruptcies, five of the large Metropolitan County Councils also created Enterprise Agencies or Enterprise Boards in order to supply long term capital to small local businesses. These included Greater London Enterprise, West Midlands Enterprise,

[1] British Steel Enterprise is now UK Steel Enterprise and supplies loan and risk capital to businesses in former and present steel areas. Equity investments vary between £25,000 and £250,000. It is also a co-manager of unsecured equity capital funds in South Yorkshire and Wales.

Lancashire Enterprises, Yorkshire Enterprise and Merseyside Enterprise, and by the mid-1980s there were some 20 local-authority based institutions of this kind, the majority associated with Labour-controlled councils. These enterprise units typically raised monies for investment by appropriating a fraction of the local property tax (known as the local rate, and later to be renamed the Community Charge). During the Conservative governments of the 1980s the funding of such boards was seen as an inappropriate use of public money and was outlawed by legislation. However, several of these agencies managed to survive by privatising themselves, rolling over their capital, and seeking new sources of investment from the private sector (examples include Yorkshire Fund Managers, Enterprise Plc, West Midlands Enterprise and Greater London Enterprise). These enterprise fund managers usually have retained close links with their local governments and economic regeneration agencies, so that they have continued, to some degree at least, to have a specialist focus on small-firm high-risk investments in order to support their local economies. Yorkshire Fund Managers, for instance, continues to have local authority representatives on its Board and believes that its ethos reflects the legacy of its public sector, economic development origins.

Other fund managers have also been more recently created by local development agencies and TECs (Training and Enterprise Councils). For instance, the Merseyside Special Investment Fund was established in 1996 by a coalition of local development institutions in order to use EU Objective 1 funding for Merseyside to fill a perceived local equity gap. MSIF began as a £25 million fund, consisting of a fifty-fifty mix of private and public cash from Barclays bank, the Merseyside public sector pension fund and an ERDF grant. It now has three funds totalling £80 million and in 2000 created its own fund manager, Alliance Fund Managers. The MSIF model is being copied in other Objective 1 areas. In the North East, for example, Northern Enterprise Limited was created by a similar coalition of agencies. Such specialist fund managers have often drawn on European Union monies or the European Investment Fund (EIF), a recent equity investment arm of the European Investment Bank, and also became key players in the Midland (now HSBC) Enterprise Funds. The Midland programme was introduced 1993, following a Business in the Community Taskforce report that highlighted the problem of the equity gap for SMEs. The then Midland Bank became the lead investor

in nine regional funds, established as limited partnerships with ten year life-spans, managed by independent private fund managers who could invest between £10k and £150k in small companies. TECs and Business Links provided support for the running costs of these funds and in 1998 the European Investment Bank invested a further £20 million. They are now known as HSBC regional enterprise funds and the bank has invested a total of £37 million.

Finally, the Scottish, Northern Ireland and Welsh Development Agencies also created venture capital arms in the early 1980s. In fact the Scottish Development Agency (subsequently renamed Scottish Enterprise) has had an investment arm since 1975 and, in 1982, this became Scottish Development Finance (SDF). As Hood (2000) explains, initially SDF subordinated the aim of making investment returns to economic development objectives and was criticised for providing bailouts to 'lame ducks' in declining industries. After surviving a period of political uncertainty and opposition between 1989 and 1991, SDF gained more commercial credibility as it became a specialist investor in high-technology start-ups. A key innovation here was the provision of a guarantee by the newly established EIF in 1994. This allowed the establishment in 1996 of the Scottish Equity Partnership as a £25 million limited partnership with an equal public-private investment contribution. The EIF's involvement guaranteed the repayment of the private sector's contribution to the Fund. In 1997 SDF also set up the Scottish Technology Fund in a joint venture with 3i and has also become the manager for a University Challenge Fund. In 1999 SDF became an independent venture manager company (Scottish Equity Partners Limited), although Scottish Enterprise retains a 25 percent stake. According to many observers, the consequent primary emphasis on investment returns has been associated with upward move in deal size and a move away from investing in small high risk companies within Scotland. In the Scottish Executive's view, therefore, there is once again a need for a new programme of direct intervention in the high-risk, small end of the venture capital market. Moreover, the appearance of a new direct interventionism designed to remedy market failure has been shared with the Westminster government.

The arrival of New Labour in government in 1997 signalled a significant break in venture capital policy in the UK. The Labour Government has continued and enhanced several established SME loan-based programmes, but it also expressed the opinion that loans programmes encourage a grant dependency, discourage risk taking and attract lower growth companies. It noted that debt is often inappropriate for high-growth companies as they lack the appropriate security, and cash-flow constraints can make servicing difficult and restrict the company's growth. While the Labour government has therefore reinforced fiscal incentives for equity investment, it has also supplemented these with a new series of policy interventions designed to stimulate a new 'knowledge driven economy' and emulate the genesis of the New Economy in the United States. The Government has adopted a series of measures designed to promote the supply of seed and risk capital.[1]

In March 1998 the Government announced the University Challenge Fund as a collaboration between itself (£25m), the Wellcome Trust (£18m) and the Gatsby Charitable Foundation (£2m). This is designed to assist Universities in commercialising their scientific research by supplying seed finance for market research and proto-type development. The aim is to fund businesses to allow them to produce a sound business plan and make credible approaches to commercial investors (Office of Science and Technology 2002). The first round funding was £45m plus £15m from university matched funding. It created 15 seed funds of up to £5m with a cap of £250,000 for a single project involving 37 institutions (28 institutes and 9 institutes. A second round involving £15m from the DTI was announced in 2000. The Government has described this initiative as a regional policy in that it illustrates how "national policy priorities can be treated flexibly, to deliver regional centres of excellence" (HM Treasury/DTI 2001: para 4.46). In 2001, however, the DTI stated that it was reducing its annual funding of this fund from £9.4m to only £586,000

[1] In November 1999 a Phoenix Fund was established to provide better access to finance and business support for firms in deprived areas. This was originally £30m which was trebled in July 2000 to £100m and it includes a loan guarantee scheme, a CFI fund, a mentor network, and a development fund. The Department for Transport, Local Government and the Regions had also created a Coalfields Enterprise Fund to supply venture capital to firms in former mining and coalfield areas. It has invested £10m and Barclays Bank a further £10m. The Fund was to be run by Coalfield Partners, an independent manager consisting of Enterprise Ventures Limited and GLE Development Capital.

Some of the seed funds have been slow and cautious at investing their money, the large consortia surrounding the funds have often been slow to establish and organise, and the funds have found it hard to appoint experienced fund managers. The DTI comments that "it would clearly be inappropriate to provide public funding in advance of need" (Select Committee on Trade and Industry 2001: para. 58). Moreover, these difficulties may reflect a broader wariness of University commercialisation projects among the UK venture capital community. Several of our interviewees stated that such projects were often too far removed from getting products to the market to be worth risking investment.

A similar reliance on regional actors to deliver national policies has been apparent in the public promotion of venture capital. Some of the local and regional examples discussed earlier were identified as useful policy models, particularly those that had successfully managed the Midland (HSBC) Enterprise Funds. At the same time, the Government argued that without public sector support the existing 'equity gap' funders would tend to move up to larger deals (DTI 1999: 30). It estimated that only five of the existing 15 BVCA members investing under £250,000 managed funds of a viable size, that is, over £10m. Moreover, relying on an uneven and small set of local actors was an inadequate response to the equity gap for SMEs. This was described as a national problem, but one that was amenable to a regional solution.

The 'equity gap' has been identified as a national problem with regional solutions. Those funds which have historically demonstrated success in the 'equity gap' tend to be those which are situated physically close to where investments are made and which have an understanding of local business networks. Funds which are embedded in a business community can control their due diligence costs by drawing on local knowledge and experience. But not only was the equity gap presented as a national problem. At times the Government also suggested that there might be specific regional market failures. It was frequently noted that there are substantial regional variations in small firms creation rates, with the rate of VAT registrations per 10,000 people being three times as high in London as in the North East. In the government's words, "There is a strong role for a regional investment policy where it can tackle particular regional

market failures" (HM Treasury/DTI 2001: para 4.38). The Treasury describes how public support for risk capital constitutes an umbrella fund to be operated by a new Small Business Investment Taskforce in co-operation with the RDAs. In accordance with the Chancellor's expressed aim of ensuring "balanced economic development across the regions and nations of the UK", the policy was to ensure that all enterprises wherever they are located can access the finance they need. As part of this strategy, the SBS and RDAs will co-decide on regional priorities - the criteria for the funds and the allocation of government support - to narrow the equity gaps for small scale venture capital across the UK. For example, relative to their SME sectors, the North of England, South West and Wales have 50 percent or less early stage venture capital compared to the UK as a whole. The £1 billion target umbrella fund should go a substantial way towards narrowing regional disparities and moving the market forward over the next 3-5 years.

In line with these aims, the Government's 1998 Competitiveness White Paper announced a new Enterprise Fund totalling £180m which would draw on local expertise and a new support network for business proposals (DTI: 1998). This included a High Technology Fund (which is a 'fund of funds') that invests in venture capital funds which target early stage high technology companies. The DTI acts as the cornerstone investor providing £20m (€30m) on subordinated terms and this has attracted a further £106m (€160m) from private investors and the EIB. The Enterprise Fund also included the creation of a minimum of nine Regional Venture Capital Funds (RVCFs). The largest component of the Enterprise Fund is a revised Small Firms Loan Guarantee Fund. The RVCFs involve £50m (€75m) of government funding expected to lever in around £250m (€375m) of private backing. The structure of these funds imitates the Midland Enterprise Funds, as they sought to create a viable fund in each of the English regions, managed by commercial and experienced fund managers. While the other Enterprise Funds operate throughout the UK, the RVCFs are limited to England so as not to duplicate the venture capital schemes already operational in Wales, Scotland and Northern Ireland.

The programme's main aims are first, to increase the amount of 'equity gap' venture capital available to SMEs (in amounts up to £500,000, approximately €750,000) without displacing existing fund activity in this market segment. Second, the objective is to ensure that each region has access to a viable regionally based venture capital fund making small equity investments. The third aim is to demonstrate to potential investors that commercial returns can be made by funds investing at the smaller end of the market and thereby attract other actors into this market segment, increasing the supply of highquality fund mangers operating in the 'equity gap' segment. Private sector fund managers were invited to tender for the management roles in each region, and the managers approved and appointed by the Small Business

As critics of the RVCF programme predicted (Mason/Harrison: 2001), in some regions it was clearly difficult to find appropriately experienced managers, with the result that some managers are handling several regions. The issues raised by this are discussed in Chapter 4. However, each fund is to operate within its regional boundary and will be governed by a 10-year limited partnership (with the possibility of a two-year extension). The fund managers are to make decisions about their investments on the basis of commercial criteria, although the businesses must not be owned (above 25 percent) by another company or companies and comply with the EU's definition of an SME, which means less than 250 employees and either a turnover of less than £24m (€36m) or a balance sheet total of less that £16m (€24m).

While these are generalist funds with no explicit sectoral foci, as a condition of EU State Aid approval there are also some sectoral exclusions, which include land and property, financial services, accountants and legal services, hotels, nursing and care homes, international motor transport, agriculture, forestry and timber production and horticulture. Managers can invest up to £250,000 into qualifying business in start-up, early stage and development and acquisition and buy-out stages. If another venture capitalist is already invested or co-invests with the fund then total investment of both funds cannot exceed £250,000. Follow-on investments of another £250,000 can be made after a six-month time period. These rules are clearly designed to keep the funds firmly in the smaller, high-risk segment of the venture capital market. The managers

will report on activity and performance to an investment Advisory Committee and presumably to the partnership's General manager as well. The Regional Development Agencies (RDAs) are charged with supporting the operation of the funds in their region primarily by using their networks of business contacts. In order to address possible regional market failures, the consultation document on the RVCFs issued by the DTI, emphasised that the fund managers would be embedded in their local business communities. It also noted that regional delivery offered the opportunity to vary the levels of support according to differing regional conditions and thereby to make the funds equally attractive to private investors in all areas. "There might, for example, be a case for a lower level of support in more prosperous areas such as the South-East, in the expectation of that region having access to many more investment opportunities". "It is conceivable that additional incentives could be given to funds to make a proportion of their investments in sub-regions, such as the Assisted Areas or areas which face a particular short-term difficulty, such as a major closure". (DTI 1999: 10) However, the feedback received during consultation was apparently divided on the merit of offering additional incentives, and a number of respondents expressed the opinion that this could lead to poor investment decisions. The possibility of such incentives was dropped and any aim of remedying regional disparities in venture capital markets was downplayed. Indeed the Small Business Service (SBS) informed that the funds do not represent any form of regional policy (Interview). In terms of investment, the SBS, on behalf of the DTI, is investing a varying amount into each fund, depending on the size of fund specified by the prospective managers during the contracting process. The DTI is responsible for between 25 and 40 percent of investment and there is no immediately obvious regional logic behind this share. For instance, it is the same in London as it is in the North East. In addition, the SBS has secured funding from the European Investment Fund (EIF) and in most cases funding from these two sources will provide 50 percent of the total investment. In order to enable the Fund Managers to attract the requisite fifty percent private investment, the DTI is to subordinate its investments by putting a cap on its return (thus raising the return to other investors) and by agreeing to accept the 'first loss', meaning that in the event of an erosion of a fund's capital base, its investment suffers the loss first. Barclays Bank has become one of the key investors in the regional

funds, as has the Royal Bank of Scotland, and local authority pension funds have also become a vitally important private source of capital.

The East Midlands Fund, which was one of the first to be put in place, does not have Barclays funding and is heavily dependent on the County Council pension funds. It closed at £30m in January 2002 (well over its target of £20m). In contrast, the RVCF in the South East had difficulty in attracting corporate and local authority pension fund investors to the same degree as in other regions. SEEDA (South East England Development Agency) considered making its own equity investment into the fund but eventually West Midlands Enterprise invested £300,000 and the fund closed at £22.5m, below its indicative target of £30 million.

Partly as a response to the English RVCFs, Scottish Enterprise has also agreed to a new set of venture capital policies to support SMEs. It is to divert part of its Regional Selective Assistance grant to establish a new £20m Scottish Co-Investment Fund. The Scottish Co-Investment Scheme (SCS) will invest in private funds targeted at the equity gap of up to around £500,000. It will invite bids for private funds focusing on start-up, early stage, and building of technology companies. In addition, the Business Growth Fund is to be redesigned as a debt and equity vehicle able to provide funds in the £20,000-£100,000 range (absorbing £5m per annum over the next three years). Finally an Investment Readiness Programme will operate more on the demand-side. It will provide financial support to growth businesses to assist with the costs of making their propositions investment ready - up to a maximum of £10,000. Officials from an Enterprise Network will also work with client companies to improve their search for funds and proposals. £4.5m over three years will support the grant element of this scheme. The SCS has similar, if slightly more cautious, aims than the English RVCFs, but it is noticeable that the structure and parameters of the fund are significantly different. The primary objective of SCS is to stimulate the provision of certain levels of equity funding currently not adequately provided by the market in Scotland. It is hoped that this will provide sufficient flexibility to stimulate additional private sector activity and as a consequence help to alleviate financing difficulties typically encountered by early stage investment propositions (Scottish Enterprise 2002).

The SCS will invite bids from experienced funds and other informal 'gap actors' and successful applicants will enter into a management agreement with Scottish Enterprise involving co-investments on equal and commercial terms. These actors will draw down matching funds as they make qualifying investments and will receive commercial management fees. The guidelines suggest that SCS commitments to funds will be in the range of 25-50 percent up to a maximum of £4m. Co-investments will be made up to a maximum SCS investment of £500,000, within a deal size ceiling of £1m. In general, individual investments are again to be at the discretion of the fund manager.

It is clear that the development of regional venture capital policies in the UK and Germany has been strongly conditioned by the different characterof financial industries and financial regimes in the two countries (Bascha/Walz 2001; Becker/Hellmann 2000). The traditional reliance on bank based loan capital in Germany explains why it was necessary to use anextensive range of public policy measures to construct a venture capitalindustry, virtually from scratch, during the 1990s. The bank-dominated financial system meant that innovative high-technology start-ups were unlikely to be funded in the absence of a significant policy strategy to create and support new equity funds and markets. "Given the lack of fit between the native institutional environment and the needs of high-tech entrepreneurship German policy makers have resorted to extensive 'compensatory' measures to encourage the founding of high-tech start-ups." (Lehrer 2000: 92). The prevalence of public and semi-public actors and the dominance of public financial support in the German venture capital market is unusual (Bascha/Walz 2001). In the UK by contrast, despite long standing concerns about the funding of small firms, the fact that a very large venture capital industry already existed meant that the case for policy intervention and evidence of market failure has been more controversial. Thus it was not until the late-1990s that central government decided to try to directly increase the supply of venture capital to these firms. Its intervention has so far been on a much smaller scale and aimed at demonstrating to the private sector the potential profitability of investment in the (small firm and start-up) 'equity gap'.

Furthermore, the distinctive institutional environments as well as the different aims have also shaped the instruments and mechanisms used to deliver public support to the

venture capital industry. The reliance on guarantees and on the supply of capital via refinancing loans and silent capital co-investment in Germany seems to stem from, and conform with, the traditional means of providing SME support through loans and guarantees. In the UK, in contrast, the traditional orientation towards fiscal incentives and, in the case of the RVCFs, the adoption of a fund-of-funds approach run as limited partnerships with a 10-year limit and the delegation of investment decisions to private managers, demonstrate the stronger market orientation of venture capital policy there.

However, the development of regional venture capital policies in the two countries is not just a matter of national institutional and financial contexts and central government decisions. It has also involved significant interactions between central governments and local and regional authorities. In Germany several Länder governments initiated their own venture capital policies during the 1990s and in most cases these regional initiatives have been designed to draw down and make use of the increasing amounts of KfW and DtA finance available. The precise form of these regional policies has varied significantly between different Länder, reflecting their institutional relations of decision-makers, the nature of their economies and their commitment to other technology initiatives. The discovery of such decentralised reactions to and incorporation of central initiatives is perhaps not surprising in a federal system. It has also become very obvious that intermingling of national and regional monies is such that there is no clear demarcation between policies at different spatial scales. It is perhaps more surprising to find that in the UK local and regional policies and actors have also played an important role in the recent development of venture capital policy. In most regions specialist 'gap' regional fund managers often created by local and regional development agencies have existed since the 1980s. Their ability to capture and manage private enterprise and European public funds, suggested a possible means of public intervention that could possibly reconcile economic development goals with a market-conforming style of operation and decision-making. Such schemes thereby demonstrated the potential value of public-private partnerships in the regions. Recent central government policy has been designed with these models in mind and, indeed, is partly aimed at ensuring that such local partnerships prosper and are not pressured by

market imperatives to move their deal sizes upwards into conventional venture capital territory.

4.3.3 Guarantees: An Evaluation of Germany's Predominant Policy Instrument

Risk mitigation schemes in form of guarantees were introduced in Germany because venture companies and private equity companies had expressed a preference for this policy instrument (Interview Bundeswirtschaftsministerium 2002). Their introduction and massive use (partly covering up to 80 percent of the private investment), however, changes the investment behaviour and incentives structure of the market, since public guarantees affect the risk return relationship for the investor. On the one hand investors, who target a low minimum rate of return and are covered by guarantees, receive a sufficient risk reduction to go ahead with an investment project. This quantitative argument is supported by the lower targeted and realised return rate in Germany despite the fact that German venture capital companies invest a larger proportion of their funds in high technology manufacturing and early stage. These investments may otherwise not have happened. On the other hand guarantee programmes, where the public participates in losses but not profits, may also lead to riskier investment projects by reallocating funds for investment. This qualitative argument of adverse selection is partly supported by the larger share of venture capital companies in Germany whose investments turned sour in the critical year 2001 (table 4.14).

The survey shows that in comparison to the UK, German venture capital and private equity companies targeted and realised a lower return rates but German companies had nevertheless a higher failure rate in 2001. The losses for UK companies with a negative realised returns are, however, higher due to the lack of guarantees, yet losses for public budgets were clearly higher in Germany as guarantee disbursements have apparently exceeded €1 billion (Bundesrechungshof 2002). Even when public bodies may not be able to distinguish between investment projects investment project that would have gone ahead without guarantees and those that lead to additional investment, for private investors Germany's state guarantee schemes for venture capital and private equity

investment transform volatile assets into more stable assets as discussed in chapter 2 on the macroeconomics of financial systems. The arrangements in the venture capital and private equity market therefore reinforced the macroeconomic differences between financial systems in which changes in profit expectations in bank or intermediary based financial system exert a stronger influence on investment and economic activity.

Some authors argue that the provision of guarantees may simply lead to a more hands-off approach on the part of venture capital firms (Keuschnigg/Nielsen 2001, Schertler 2002). The channels through which the policy instrument 'risk mitigation' is supposed to fulfil the policy objective and induce investment that otherwise would not occur requires therefore a more detailed analysis. The survey results suggest that German companies do indeed provide less managerial intervention in their investee firms, a feature even more marked for those firms in which public money accounts for half or more of their funding. Although the massive use of guarantees may induce these problems of moral hazard, public actors nevertheless seem to expect that lead investors should engage with management issues at the investee firm (Interview Project Manager, Public Co-Investment Institution).

Table 4.14: Failure Rate in the Portfolio of Venture Capital and Private Equity Companies in Relation to Number of Companies and Volume of Investment (2001)

Failure rates in percent	UK		Germany	
	number of companies N=46	volume of investment N=51	number of companies N=82	volume of investment N=93
0 – 5%	43.5%	43.1%	40.2%	43.0%
5% - 10%	32.6%	25.5%	22.0%	20.4%
10% - 15%	10.9%	19.6%	14.6%	18.3%
15% - 25%	8.7%	11.8%	15.9%	12.9%
> 25%	4.3%	0%	7.3%	5.4%

Source: Own Survey

The effects of guarantees and many other factors influencing the investment behaviour of German venture capital and private equity companies cannot be fully understood via an analysis restricted to descriptive statistics.[1] Kendalls's rank correlation coefficient (tau) for the failure rate (related to the number of investee companies) and risk mitigation (guarantees) as an important aspect of public programmes for additional investment is -0.367 ($p<0.0005$, $N=76$).[2] Pearson's correlation coefficient (r) yields -0.328 ($p=0.02$) (see table in appendix D). In comparison to experimental research which designs the set-up in order to control for other factors involved, survey results become contaminated with these, so that the variance in one variable can hardly be explained by the variance of one single variable. There are many factors that determine the investment behaviour and the failure rate, some of which may not even be covered in the survey. However, risk mitigation as important aspect of public programmes that lead to additional investment yields clearly the strongest impact on the failure rate. Controlling for risk factors like 'expected minimum return rate of return', 'investment allocation to seed and start-up', and 'investment allocation to high technology sectors', and some further aspects of public programmes has hardly any effect on the results. The level of statistical significance is extremely high.[3]

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[1] Going beyond these limits Appendix D presents correlation results for many of the factors involved. Appendix E provides some correlation results that focus on the relationship between guarantees and investment behaviour. Appendix F presents some partial correlation results controlling for factors that were correlated with the usage of guarantees or the failure rate. Eventually, Appendix E contains a regression analysis and aims to quantify the effect of guarantees on the failure rate. Appendix D provides zero-order bivariate correlation results for Germany. The variables appear in the order of the questionnaire. The first table uses Pearson's correlations coefficient (r). There is a debate whether these should be used for ordinal data (O'Brien 1979). Furthermore, since the size of ranges offered for the failure rates differ in the survey and upper or lower ranges for some variables are limitless, the characteristics of some of these variables also become more or less ordinal, when the range definitions are recoded into 'cardinal' numbers. Therefore, a table for rank correlations is added (without the variables measured as percentages but additionally with the ordinal variable about the involvement with public venture capital instead of the share of public finance). As there are many tight groups the correlation coefficient and significance levels were derived using Kendall's tau for these. The rank correlation coefficients produced are usually slightly smaller than with Spearman' rho (Bryman/Cramer 2001: 179).

[2] The probability to derive at this result by chance is so low that the statistical software package presents the p-value as zero. SPSS delivers in general only p-values with three decimals, that means p is smaller than 0.05%.

[3] A regression analysis with risk mitigation as independent variable and failure rate as dependant variable yields -0.328 for Beta (significance level is 0.004, adjusted R square is 0.095). In other words, companies that ticked just one lower number for the higher importance of 'risk mitigation (guarantees)' classified from 1 to 6 move on average 0.328 increments up on the five ranges defined for the failure rates, according to the line of best fit for the regressions. This indicates a very strong impact of guarantees.

The second constraint with the largest difference in both countries 'Difficulties in monitoring investee companies' may indicate that German venture capital companies lack the means or experience to tackle the risks typically inherent in venture capital finance. A hands-on approach and intensive monitoring can reduce problems resulting from asymmetric information and moral hazard and provide managerial advice. Only 50 percent (N=104) of German VC companies influence the management of the investee company. In the UK 90.9 percent (N=55) of the respondents to this question expressed to take a hands-on approach (question B8). Public guarantees in Germany may induce this behaviour because they also reduce the incentive to overcome monitoring difficulties, but the hypothesis, that guarantees do not effect a hands-on approach, could not be rejected (tau=0.072, p=0.225, N=93; see table in appendix D). The investment constraint 'lack of experienced managers' is also hardly related to a hands-on approach, so that an explanation of the large differences between both countries cannot solely rely on differences in the maturity of the markets.

Eventually, three factors remain that are significantly related to influencing the management of the investee company and can explain the differences between Germany and the UK. These are the expected minimum return rate (tau=0.416, p=0.000, N=89), a bank as the largest owner of the venture capital and private equity company (tau=-0.252, p=0.006, N=101) and access to refinancing loans as important aspect of public programmes (tau=-0.233, p=0.008, N=87). Apparently guarantees may not affect the management approach directly, but, with a significance level that indicates a strong impact, they do motivate venture capital and private equity companies, that normally target lower minimum return rates, to investments, that otherwise would not have happened (tau=0.356, p=0.000, N=82; Beta=0.401, significance=0.000, adjusted R square=0.151). And these companies, which target a lower minimum return rates, have banks as largest owner and have a relatively easy access to refinancing loans, typically provide less managerial input. Venture capital companies that have specialised in the high risk area of early stage and high technology investments have developed and use appropriate instruments to tackle the risks involved, so that they, somewhat surprisingly, perceive a prohibitively high risk as less of an investment barrier than other venture capital private equity companies do (KfW 2003: 40). A hands-on

approach with the provision of managerial advice and intensive monitoring is one of these instruments. In credit markets relationship banking, a well known feature of the German financial system, can reduce credit rationing to smaller and start-up firms, that are generally less informationally transparent (Petersen/Rajan 1994). However, building relationships is costly and takes time. Guarantees have largely replaced the need for some venture capital and private equity companies to invest in these efforts. In comparison financial intermediaries in the so called market based financial system in the UK use these instruments for venture capital and private equity investment.

4.3.4 Co-Investment in Funds: An Analysis of the UK Government favourite Policy Instrument

In the UK by contrast a large venture capital industry already existed but there has been a long debate about whether and why the financial sector fails to provide SMEs with funding means. In one of the latest attempts to resolve this issue UK central government decided to directly increase the supply of venture capital to small firms via the new Regional Venture Capital Funds (RVCFs). Its intervention is on a much smaller scale and not comparable to the over one thousand regional and national programmes for start-up companies in Germany, for which even experts hardly have an overview and lose track of new developments (Hannemann/Schmeisser 2001). In the UK the RVCSs aim to demonstrate to the private sector the potential profitability of investment in the (small firm and start-up) 'equity gap'. The main element consists of the public co-investment into these regional funds but there is also a risk mitigation aspect for the private investors since the first loss principle and the capped return for the public investment inhibit an asymmetric pay-out. This design smoothes somewhat the incentive effect along the range of potential returns. Guarantees come into effect at the point when an investment project starts to fail so that a manager could tend to divert efforts to other investment projects. The UK initiative is not open-ended. In the case of the RVCFs, the adoption of a fund-of-funds approach run as limited partnerships with a 10-year limit and with the delegation of investment decisions to private managers. It involved £50 million of government funding. Since the UK government allocated a

fixed specific amount to the regions (that was not driven by any re-distributional aim) there is no positive regional correlation of public money and private venture capital investment which is, on the contrary, the case in Germany. This result for Germany reflects the policy instruments used and the willingness of the German national government to increase planned budgets whenever demand overshot expectations (Interview Bundesministerium für Wirtschaft 2002).

In the UK, on the one hand, not each investment is scrutinised by public bodies, so that public co-investment in funds like these look less bureaucratic. A faster decision process and less bureaucracy is perceived as most important to improving public venture capital programmes in both countries (Germany: Ø=2.03, N=92; UK: Ø=2.10, N=29) (question D9). On the other hand the agency risk is higher in that the performance of each fund will depend primarily on the performance of each nominated manager. Furthermore, the funds are not available to all potential investee companies, the investment decisions depend exclusively on the regional fund manager so that these funds, without any competitors providing other opportunities of public support, may become regional monopolies of public monies. Although in both countries the governments largely refrain from picking winners, it is at least controversial which approach is more market oriented.

Whereas venture capital companies in Germany in general acknowledge the supportive function of public programmes and public private partnerships there is a widespread view in the UK that public initiatives compete with private investment and crowd it out. The dominant, though not unanimous view among the UK venture capital industry is that policies should demonstrate that commercial returns can be made from small firm funding and then withdraw, leaving private firms to fill the gap. The government followed suit. Although for example the new Regional Venture Capital Funds have defined target areas where there is supposed to be an equity gap, investee companies could still be in the position to attract private investments, but would be reluctant to do so if this happens on less favourable terms. The additionality or complementarity of these public funds is, however, not questionable when the fund managers engage in 'cherry picking' by allocating investment proposals with promising return rates to a

private fund and those, that would not have been financed with private monies alone, to the Regional Venture Capital Fund (Interview fund manager 2002). For three more reasons it looks unlikely that the demonstration effect will be successful in closing a gap after the public support is phased out. First, future good return rates could have many causes, for example favourable market conditions. Second, a regional infrastructure is created that depends solely on the experience gained by one manager. Finally, some transaction costs remain genuine and may not be overcome without public support: for example high fixed due diligence cost. It is advisable that the UK government conducts a cost-benefit analysis which includes regional positive spill-over effects on employment and productivity instead of simply hoping that the demonstration effect will suffice when the programme reaches the time of termination. A demonstration effect can only work effectively when there are two adjunct market gaps with different potential market actors who make their decisions independently. But it looks very unlikely that business angels, who are active in lower deal sizes, have waited for the Regional Venture Capital Funds for their investments in order to become dependant on the decisions of one particular manager for their potential exit option. The opinion of the UK survey respondents is split on this issue. 48.7 percent (N=39) believe that the demonstration effect is not likely to work (question D11). However, 'public co-investment in funds' is the single aspect of public programmes, that has led to investment that otherwise would not have occurred, with a better rating than in Germany (see table 4.13). This result also reflects the availability of instruments in both countries. The RVCs were being set-up at the time of the survey but similar initiatives were already in place, notably public co-investment in funds set up with European Investment Bank and the European Investment Fund. Furthermore, there are other specialised funds, for example the High Technology Fund, the Phoenix Fund, the Early Growth Fund, the University Challenge Fund and the Regional Innovation Fund.

The UK survey sample is rather small and hardly allows a detailed analysis beyond the limits of descriptive statistics. However, some significant correlations of the UK survey data support a critical view on the envisaged demonstration effect (appendix H). The realised return rate in 2001 is negatively correlated with the percentage share of the number of investments in the lowest deal size range below £100,000 (r=-0.418,

p=0.009, N=32) and also in the range from £100,000 to £250,000, which was targeted by the RVCs (r=-0.380, p=0.016, N=32) (see table in appendix D). Similar relations show in the seed (r=-0.433, p=0.005, N=34) and start-up business stage (r=-0.393, p=0.011, N=34). Whereas in Germany 77.6 percent of the respondents were involved with public programmes in some form or another in the calendar years 1999 to 2001 (N=107), this percentage drops to 40.4 percent for the UK (N=57). In comparison to other companies in the UK, venture capital and private equity companies that were involved with public venture capital programme and public investment also had a lower realised return rate in 2001 (tau=-0.310, p=0.022, N=34).

4.4 CONCLUSION

This chapter presented survey results about equity funding gaps in Germany and the UK. Elaborated concepts were used and guided the design of the questionnaire, it is the first time that empirical survey results about funding gaps have been derived and linked to conceptual issues in this way. The addressees of the questionnaire were venture capital and private equity companies. Financial intermediaries are the best source since they perceive both potential supply and demand constraints. The survey indicated considerable equity gaps in both countries. However, the perceptions of 'normative' funding gaps, those that should be tackled by government policies, were more pronounced in Germany. German companies perceived 'risk mitigation' as the most effective policy instrument. In contrast in the market based financial system of the UK companies were rather critical towards government intervention, public co-investment in funds would be their first choice. The evaluation of policy instruments indicates the existence of a trade-off between potential positive spill-overs in employment and productivity on the one hand, and negative effects on failure rates and realised returns on the other. A proclaimed 'demonstration effect' for the new English Regional Venture Capital Funds is hence unlikely to operate.

In the bank based financial system of Germany, guarantees have significantly increased investment failures and also motivated private equity companies to invest in higher risk areas for which they have not developed adequate instruments, notably a hands-on approach with strict monitoring and managerial advice. And these companies, which target a lower minimum return rates and often with banks as largest owner and therefore with relative easy access to refinancing loans, typically provide less managerial input. On the one hand there are similarities between both countries. Financial intermediaries that build upon relationships for investment purposes exist in both countries, but they are active in different market segments that accordingly differ in their size. On the other hand Germany's state guarantee schemes for venture capital and private equity investment transform volatile assets into more stable assets as discussed in chapter 2 on the macroeconomics of financial systems. The arrangements in the venture capital and private equity market therefore reinforced the macroeconomic differences between

financial systems in which improvements in profit expectations in bank or intermediary based financial system exert a stronger influence on investment and economic activity. In a downturn public guarantee pay outs reduce losses for private investors and exert a stabilising effect on the industry, which may, however, form a barrier for a required restructuring of the industry.

In this chapter the following policy implications are derived: risk mitigation schemes are effective, though not necessarily efficient, in closing a venture capital, and potential public pay-outs may be large. With regard to their incentive effects they should not surpass certain limits and target venture capital and private equity companies that apply adequate instruments to tackle high risk investments. Public co-investment in funds is the least bureaucratic option. Once these funds are set-up the engagement of public bodies in scrutinizing investment projects can be largely withdrawn. The institutional risk is, however, high. It depends crucially on the competence of the fund manager. It is also important that several fund managers compete for investment proposals in the relevant market segments. Otherwise a monopolistic structure of public support would be created and public money would not be spent in a market oriented way. Eventually, the evaluation of policy instruments should be based on a proper and complete cost-benefit analysis which includes positive spill-overs to the economy. This analysis has to take account of available policy options in each country which depend on the current design of the financial system and the need to embody certain policies with existing specific private and public institutions.

CHAPTER 5

CONCLUSION

5.1 AIMS AND OBJECTIVES

Whereas financial systems can in principle be compared with regard to numerous aspects this thesis has focussed on the transformation of volatile into stable assets and the role of different financial intermediaries. Existing differences of the institutional settings in both countries may on the one hand lead to distinctive macroeconomic fluctuation and require policies adopted to a given design of the financial system. One aim of the thesis was to apply the approach of traditional macroeconomic analysis to comparing financial systems and demonstrate its usefulness for this purpose. The second aim was to analyse the private equity and venture capital industry in both countries and national policies to promote this industry. The two areas of research appear quite distinct at first glance but they highlight both main differences between a bank and a market based financial system and are linked. In comparison the UK market based financial system Germany's bank based financial systems transforms a larger amount of volatile assets into fixed income assets for private households. Typically the transformation function for these assets is performed to a lesser degree by banks in market based economies. Venture capital and private equity companies in particular regularly refrain from offering any degree of this kind of transformation in market based systems.

5.2 THEORETICAL REFLECTIONS AND KNOWLEDGE ADVANCEMENT

In contrast to recent academic developments, which aim to integrate the latest findings made in the area of the Theory of Finance into macroeconomics, one aim of the thesis is to demonstrate the usefulness of traditional macroeconomic analysis. The traditional analysis is applied to financial systems and the differences between market and bank

based systems by focussing on the role of financial intermediaries in transforming the volatility of assets. Implications and conclusions are derived in the opposite way in comparison to the approaches based on the Theory of Finance. It starts on the macro level and analyses available assets according to their importance in different financial systems. In comparison to the UK market based financial system Germany's bank based financial systems transforms a larger amount of volatile assets into fixed income assets for private households. The traditional analysis can also be used for analysing the role of endogenous money and credit finance for autonomous demand, be it investment or consumption. A re-interpretation of the macroeconomic income multiplier, which equally permits autonomous consumption, adds a further theoretical aspect for analysing differences between financial systems. Both elements of the traditional analysis support the argument that the market based economic system of the UK is more consumption driven in comparison to the German bank based system. A re-interpretation of the income multiplier which equally permits autonomous consumption changes its role so that consumption does not remain an appendix of the investment activity. In the theoretically extreme case of an economy where loans are only taken out for consumption or mortgage purposes, consumption would become the sole source of autonomous demand.

In the macroeconomic part a discrete-time portfolio model was developed which distinguished between bank (intermediary based) and market based economies via the share of credit financed or intermediary transformed investment. The financial sector is assumed to build up or draw on (hidden) reserves. Money is, as commonly understood, the reflex of bank lending, but it can also be the reflex of the investment by financial intermediaries who transform assets in more stable assets for households. It represents endogenous inside money, whereby financial intermediaries build up and draw on reserves. In comparison to Tobin's and Brainhard's approach the comparative static analyses of potential outcomes demonstrated that under common assumptions with regard to investment, consumption and portfolio behaviour perverse results do not happen. The comparison between intermediary or bank based and market based economies finally showed that the former are more sensitive to profit expectations, in other words, Keynes' marginal efficiency of capital, exerts a stronger influence on

aggregate income as long as the capital gain effect on consumption is not the dominant factor. The analysis also provided a new dimension for comparing financial systems. Both equity finance and credit finance can be understood as being created 'ex nihilo', depending on the transformation by the financial intermediaries. The design of the model allows to understand the flipside of both forms of finance, credit and equity, as endogenous, it is only important that households are prepared to hold a transformed less volatile asset 'ex post'.

Some important aspects of financial systems are neither captured in the comparative static model of chapter 2 nor in chapter 3 or 4. The model of chapter 2 cannot analyse internal finance, which is a feature of disequilibrium distributional effects. They may arise in between two comparative static constellations, but comparative static models only compare equilibrium constellations. A dynamic disequilibrium approach offers the advantage to combine Tobin's q, which is a stock concept, with the flow concept of Q-profits, developed by Keynes in his 'Treatise'. Both can be linked, so that in a simultaneous equilibrium of the capital and good market $Q = 0$ is equivalent to $q = 1$. The additional advantage is the possibility to incorporate the most important source of finance, which are retained profits. In general they are a result of a situation in which aggregate demand exceeds aggregate supply and in which there is a price effect in the commodity market that leads to a distributional effect in favour of productive units.

There seem to be quite important differences between these countries concerning how these profits are generated in the first instance. During phases of economic prosperity or recession the composition of aggregate demand exhibits different features in both types of economies. Thus it appears reasonable to interpret a market based system as partly consumption driven. The wealth effect of rising equity prices on consumption leads to a profit inflation and generates internal finance as an investment potential. A German-type economy on the other hand secures a stable consumption ratio via stable asset prices for the majority of households. Investment here is rather an arbitrage process of firms and banks possible through credit finance delivered by Hausbanken with relationship banking to SMEs. This initial investment raises aggregate demand and hence additional investment can be financed internally.

Financial intermediaries in bank-based systems transform a larger amount of volatile assets into fixed income assets for private households. A transformation which does even happen by a bank that simply provides loans and collect deposits. Exactly these nominal fixed liabilities of banks create a main problem of banking (Goodhard 1987). Furthermore insurance companies and private banks also hold equities in companies and transform these assets into more fixed liabilities. Private banks that are quoted on the stock market play only a minor role in Germany with regard to their market share. The state banks, Sparkassen and Landesbanken, are owned by the state, the value of Genossenschaftsbanken is neither determined nor traded on the market. The result by Mayer (1988), that the role of stock markets as primary markets for the financing of investment (new emission of shares minus buy-backs and take) even in Anglo-Saxon countries can be neglected, because eventually households keep shares in their portfolio and their value may have increased by real investment that was financed by other means and especially by internal finance.

Households willing to take out loans can provide firms indirectly with finance means for investment and simply reduce firms' requirements for newly borrowed external funds. A house market speculation and equity take outs may simply increase consumption and channel funds to firms for addition investment and production that is financed internally by retained profits. The overall quantitative effect on national income depends on the market situation and the ability of firms to raise prices. The price effect of a profit inflation is considerable reduced when new investments increase the productivity of the economy. If households, however, try to get rid of money balances via reallocations of their portfolios, the valuation of stock shares adjusts until households tend to accept their increased money balances. In the aggregate households are only successful to get rid of money balances on the stock market in as much as firms receive finance means via the emission of new equities. Although empirical evidence shows that new emission of shares play a minor role in the financing of firms even in Anglo-American economies, both effects together increase aggregate demand and income, so that eventually there is no 'excess' of money[1]. A quantitative relationship

[1] The additional amount of money balances that firms need for the finance motive and transactions in an enlarged economy reduces the amount that households have to hold so that eventually households do not

between loans, money and income does not necessarily break down when households and not firms that take out loans. In the end, aggregate demand and national income is still determined by the asset market, wealth and expected capital gains or losses. The main feature of Keynesian economics remains. At least from a paradigmatic point of view it does not matter whether the financial system channels funds directly or indirectly to the productive units, even though policy instruments to ensure full employment, growth and stability should adjust to developments and differences of financial systems and the different role units of the economy play. However, the endogenous money approach of Keynesian economics would still be valid.

The endogenous money approach of Keynesian economics is important for the understanding of the financial markets and monetary issues as it avoids a common dichotomy between money and the real word (Wray 1990, Dow 1997). It also contradicts the real balance effect which is supposed to demonstrate that a Keynesian equilibrium with unemployment is impossible with flexible wages (Patinkin 1965, Betz 1993). There, the argument is that at one point of decreasing wages and prices one unit of the money stock could purchase the entire GDP and resources of an economy. However, in circuitist terms, the so called reflux mechanism reduces money balances in line with production. When loans are paid back and new loans are not taken out, money is destroyed and there is hardly any hope in the real balance effect.

A possible development towards more market based systems highlights the requirement to analyse investment that is typically not financed 'ex nihilo' but via venture capital and private equity companies. From a macroeconomic perspective the amount of finance means available to them is determined by loans taken out for other reasons but eventually ends up as purchasing power within these institutions.

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need to end up with and accept all of the additional money balances that were created by their taking out loans.

5.3 EMPERICAL FINDINGS AND POLICY IMPLICATIONS

A survey of venture capital and private equity companies in Germany and the UK, that was based on a discussion of theoretical and empirical issues of funding gaps, indicated considerable equity gaps in both countries. Although issues of uncertainty and risk are equally important for equity finance, it is usually omitted in Keynesian articles on finance. However, the risk perception of venture capital and private equity companies are crucial elements in the investment decision and may lead to persistent funding gaps. The work represents the first attempt to detect funding gaps and distinguish between positive and normative funding gaps via survey data. Survey data and hence self-investigation can detect normative funding gaps which are those that should be tackled by government policies. Other economic approaches have so far only tried to detect positive equity gaps.

Policies supporting the venture capital industry often reallocate the risk of the private investors to the public sector. This is predominantly the case in Germany, where the government via its national institution provides guarantees after they appeared at the top of a priority list of venture capital and private equity companies. In case venture capital and private equity make use of these public instruments private investors benefit again from the transformation of volatile into stable assets and the differences between the financial systems are reinforced. The perceptions of 'normative' funding gaps, those that should be tackled by government policies, were more pronounced in the bank based financial system of Germany. German companies and banks, that are active in this market sector, perceived 'risk mitigation' as the most effective policy instrument. In contrast in the market based financial system of the UK companies were rather critical towards government intervention, public co-investment in funds would be their first choice. The evaluation of policy instruments indicates the existence of a trade-off between potential positive spill-overs in employment and productivity on the one hand, and negative effects on failure rates and realised returns on the other. A proclaimed 'demonstration effect' for the new English Regional Venture Capital Funds is therefore unlikely to operate. In the bank based financial system of Germany, guarantees have significantly increased investment failures and also motivated private equity companies

to invest in higher risk areas for which they have not developed adequate instruments, notably a hands-on approach with strict monitoring and managerial advice. And these companies, which normally target lower minimum return rates, often with banks as largest owner and therefore with relative easy access to refinancing loans, typically provide less managerial input for this form of finance.

On the one hand there are similarities between both countries. Financial intermediaries that build upon relationships for investment purposes exist in both countries, on the other hand they are active in different market segments that accordingly differ in their size. Germany is known for its relationship banking, the UK has a larger venture capital where relationship funding is applied. Furthermore, Germany's state guarantee schemes for venture capital and private equity investment transform volatile assets into more stable assets as discussed in the macroeconomic analyses of financial systems. The arrangements in the venture capital and private equity market may therefore reinforce the macroeconomic differences between financial systems in which improvements in profit expectations in bank or intermediary based financial system exert a stronger influence on investment and economic activity. In a downturn, however, public guarantee pay outs reduce losses for private investors and exert a stabilising effect on the industry, which may, however, form a barrier for a required restructuring of the industry. The recent rise in the funding activities by these financial intermediaries did hence hardly push the German financial system towards a market based system.

Section A General Characteristics of Your Business

In this section we would like you to tell us something of the character of your business.

A1. Your venture capital company is ...
(Please tick relevant box.)

☐ a corporate venture capital company (CVC) ☐ an independent VC-company ☐ public regional company ☐ other public institution

A2. In what year did your firm begin trading in the UK? ☐☐☐☐

A3. Is your main office located in the UK? ☐ yes ☐ no

A4. Where is your main (UK) office located?
(Please enter the first three digits of your postcode.) ☐☐☐

A5. How many additional offices does your firm have in the UK? ☐☐

A6. Where are all the company's branches/offices located? *(Please enter the first three digits of your postcodes.)*

☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐
☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐

A7. How important is it for you to be geographically near to the following? *(Please tick a number from 1 = very important to 6 = not important.)*

	1	2	3	4	5	6
other VC-companies	☐	☐	☐	☐	☐	☐
other financial service companies	☐	☐	☐	☐	☐	☐
your investee companies	☐	☐	☐	☐	☐	☐
existing and potential investors	☐	☐	☐	☐	☐	☐
research institutions	☐	☐	☐	☐	☐	☐
a larger agglomeration area	☐	☐	☐	☐	☐	☐
other *(please specify)* _____	☐	☐	☐	☐	☐	☐

A8. Are there foreseeable changes in the future? *(Please tick relevant boxes.)*

The number of our investment managers will ... ☐ increase ☐ stay constant ☐ decrease

Our network of branches will ... ☐ expand ☐ not change ☐ contract

We will have mergers & acquisitions, joint ventures or strategic alliances with other VC-companies. ☐ yes ☐ no

A9. What were your sources of invested capital **in the year 2001**? *(In percent, sum = 100 %)*

☐☐☐ commercial banks *(in %)* ☐☐☐ insurance companies *(in %)* ☐☐☐ Industry *(in %)* ☐☐☐ pensions funds *(in %)*

☐☐☐ internal finance of the company *(in %)* ☐☐☐ fund in fund *(in %)* ☐☐☐ public sector *(in %)* ☐☐☐ Individuals *(in %)*

A10. What are the characteristics of the ownership structure of your company? *(Please tick relevant box.)*

☐ no owner holds more than 20% of the shares of our management company ☐ one owner holds between 20% and 50% of the shares of our management company ☐ one owner holds more than 50% of the shares of our management company

A11. Is the largest owner of your company ...

a bank ☐ yes ☐ no

an insurance company ☐ yes ☐ no

an industrial company ☐ yes ☐ no

an individual ☐ yes ☐ no

a (semi-)public body ☐ yes ☐ no

other *(please specify)* _____

Section B How Does Your Company Invest?

In this section we would like you to tell us something about how your company invests in firms.

B1. How important are the following characteristics of **your** company for the acquisition of a deal and for your deal flow?
(Please tick a number from 1 = very important to 6 = not important.)

	1	2	3	4	5	6
own track record	☐	☐	☐	☐	☐	☐
own reputation	☐	☐	☐	☐	☐	☐
own networks	☐	☐	☐	☐	☐	☐
knowledge of investee's technology problems	☐	☐	☐	☐	☐	☐
personal relationship with investee	☐	☐	☐	☐	☐	☐

B2. How many **requests** for finance did your company receive **in the year 2001**? *(Please enter the number.)* ☐☐☐☐

B3. On how many of these requests for finance did you conduct due diligence? *(Please enter the number.)* ☐☐☐☐

B4. How many of these intensively checked requests did you accept? *(Please enter the number.)* ☐☐☐

B5. Please enter the average deal size during the **last three calendar years.** *(in million £)* ☐☐,☐☐☐.☐☐ *million £*

B6. And how did your average deal size change over the course of the last three years? It ... *(Please tick relevant box.)*

☐ increased ☐ hardly changed ☐ decreased

B7. What approximate percentage share of the overall **number** of investments over the last **three calendar years** has been allocated to the following classes of deal size? *(in percent)*

☐☐☐ < £100,000 *(in %)* ☐☐☐ £ 100,000–250,000 *(in %)* ☐☐☐ £ 250,000–500,000 *(in %)*

☐☐☐ £ 500,000–1,000,000 *(in %)* ☐☐☐ £ 1.0–3.33 million *(in %)* ☐☐☐ £ 3.33–33 million *(in %)* ☐☐☐ > £ 33 million *(in %)*

B8. Does your company, aside from its pure equity provision, influence the management of the investee company (take a hands-on approach)? ☐ yes ☐ no

B9. Is there a minimum threshold size of a potential investee company for you to give it a careful consideration? *(Please tick relevant box.)*

Yes, related to sales per year (take over) a company needs a minimum of ... ☐ < £ 3.33 million ☐ £ 3.33–10 million

☐ £ 10–20 million ☐ £ 20–27 million ☐ £ 27–33 million ☐ £ 33–40 million

☐ > £ 40 million ☐ No, there is no minimum threshold size for an investee company.

B10. Please enter the average percentage of your gross investment represented by the following forms of capital provided to investee companies during **the last three years**? *(in percent)*

☐☐☐ direct equity *(in %)* ☐☐☐ equity near mezzanine form *(in %)* ☐☐☐ debt near mezzanine form *(in %)* ☐☐☐ other *(in %)*

B11. Please enter the share of gross investment allocated to different business stages during the **last three calendar years**? *(in percent)*

☐☐☐ seed *(in %)* ☐☐☐ start-up *(in %)* ☐☐☐ expansion *(in %)*

☐☐☐ MBO / MBI *(in %)* ☐☐☐ bridge *(in %)* ☐☐☐ replacement *(in %)* ☐☐☐ turnaround *(in %)*

B12. Which minimum rate of return do you on average expect from new investment proposals in order to invest (gross = before tax and deductions of a risk premium)? *(Please tick relevant boxes.)*

☐ 4–8% ☐ 8–12% ☐ 12–16%

☐ 16–20% ☐ 20–24% ☐ 24–28% ☐ >28%

B13. And what was your overall **realised** rate of return **in the year 2001**? *(Please tick relevant box.)*

☐ < 0% ☐ 0–4% ☐ 4–8% ☐ 8–12%

☐ 12–16% ☐ 16–20% ☐ 20–24% ☐ >24%

B14. What was the approximate failure rate in your company's portfolio in relation to number of companies and volume of investment **in the year 2001**? *(Please tick relevant boxes.)*

volume:	☐ 0–5%	☐ 5–10%	☐ 10–15%	☐ 15–25%	☐ >25%
number:	☐ 0–5%	☐ 5–10%	☐ 10–15%	☐ 15–25%	☐ >25%

B15. Did your failure rate in the year **2001** in comparison to the year **1999** rather ...
(Please tick relevant box.)

☐ increase ☐ stay constant ☐ decrease

B16. Please enter the share of gross investment **within the UK** allocated to different regions over **the last three calendar years**. *(in percent, sum = 100 %*

☐ East Midlands *(in %)*	☐ East of England *(in %)*	☐ London *(in %)*	☐ North East *(in %)*
☐ North West *(in %)*	☐ Northern Ireland *(in %)*	☐ Scotland *(in %)*	☐ South East *(in %)*
☐ South West *(in %)*	☐ Wales *(in %)*	☐ West Midlands *(in %)*	☐ Yorkshire & the Humber *(in %)*

B17. Did you also invest abroad? ☐ yes ☐ no

B18. *If "yes"*, did the share of your foreign investments relative to total investment **over the last three calendar years** rather ...
(Please tick relevant box.)

☐ increase ☐ stay constant ☐ decrease

B19. Please enter the share of gross investment allocated to different sectors of the economy over the **last three calendar years.** *(in percent)*

☐ IT, telecommunication, media *(in %)*	☐ other business & personal services *(in %)*	☐ manufacturing, high tech *(in %)*
☐ manufacturing, low tech, "old economy" *(in %)*	☐ life science *(in %)*	☐ other *(in %)*

B20. Has your investment activity become more or less specialised over the **last three years?** *(Please tick relevant boxes.)*

segments				
	business stages:	☐ increased specialisation	☐ increased diversification	☐ neither
	regions:	☐ increased specialisation	☐ increased diversification	☐ neither
	sectors:	☐ increased specialisation	☐ increased diversification	☐ neither
	companies with a specific size:	☐ increased specialisation	☐ increased diversification	☐ neither

B21. Please enter the approximate size of your company's invested and also uninvested funds at **31.12.2001**. *(in million £)*

size of invested funds *million £* ☐☐☐,☐☐☐.☐ size of uninvested funds *million £* ☐☐☐,☐☐☐.☐

B22. Do you use a systematic rating instrument comparable to credit rating? ☐ yes ☐ no

B23. *If "yes"*, how important is this rating instrument for you? *(Please tick a number from 1 = very important to 6 = not important.)*

	1	2	3	4	5	6
for pre-screening	☐	☐	☐	☐	☐	☐
for due diligence	☐	☐	☐	☐	☐	☐
for monitoring of target and management advise	☐	☐	☐	☐	☐	☐

Section C The Venture Capital Market

In this section we would like you to tell us something about the venture capital market.

C1. Are there any market segments or regions where you perceive there to be an under-supply of venture capital relative to demand? ☐ yes ☐ no

C2. *If "yes"*, where are these market gaps? *(Please tick – multiple ticks possible.)*

Sectors	☐ IT, telecommunication, media	☐ other business & personal services	☐ manufacturing, high tech
	☐ manufacturing, low tech, "old economy"	☐ life science	☐ other
Business stage	☐ seed	☐ start-up	☐ expansion
☐ MBO / MBI	☐ replacement	☐ bridge	☐ turnaround
Deal Size in £	☐ < £ 100,000	☐ £ 100,000–250,000	☐ £ 250,000–500,000
☐ £ 500,000–1,000,000	☐ £ 1.0–3.33 million	☐ £ 3.33–33 million	☐ > £ 33 million

Companies with yearly sales in £

- ☐ < £ 10 million
- ☐ £ 10–20 million
- ☐ £ 20–33 million
- ☐ £ 33–67 million
- ☐ > £ 67 million

Regions

- ☐ East Midlands
- ☐ East of England
- ☐ London
- ☐ North East
- ☐ North West
- ☐ Northern Ireland
- ☐ Scotland
- ☐ South East
- ☐ South West
- ☐ Wales
- ☐ West Midlands
- ☐ Yorkshire & the Humber

C3. What are the main constraints on your company's investment activity?
(Please tick a number from 1 = very important to 6 = not important.)

	1	2	3	4	5	6
low dealflow	☐	☐	☐	☐	☐	☐
lack of proposals with promising returns	☐	☐	☐	☐	☐	☐
perceived risk involved is prohibitively high	☐	☐	☐	☐	☐	☐
lack of information on potential investee companies	☐	☐	☐	☐	☐	☐
difficulties in monitoring investee companies	☐	☐	☐	☐	☐	☐
problems in fundraising	☐	☐	☐	☐	☐	☐
high (fix) due diligence cost	☐	☐	☐	☐	☐	☐
geographical remoteness of investee company	☐	☐	☐	☐	☐	☐
shortage of staff with VC experience	☐	☐	☐	☐	☐	☐
exit problems	☐	☐	☐	☐	☐	☐
tax problems *(please specify)* _____	☐	☐	☐	☐	☐	☐
other *(please specify)* _____	☐	☐	☐	☐	☐	☐

Section D Policies

In this section we would like you to tell us something about your experience with and views on public venture capital policies.

D1. Have you or your portfolio companies had any involvement with any public venture capital programme or investment in the **last three calendar years**? ☐ yes ☐ no

D2. *If "yes"*, which are the institutions behind the programmes you used. *(Please tick, multiple ticks possible.)*

- ☐ DTI
- ☐ local authority
- ☐ other regional institutions *(please specify)* _____
- ☐ EU
- ☐ other *(please specify)* _____

D3. Please tick the venture capital programmes you or your portfolio companies have been or are likely to become **frequently** involved with.

- ☐ UK High Technology Fund
- ☐ Budget for Flexible Support
- ☐ Regional Venture Capital Fund *please specify* _____
- ☐ Early Growth Fund *please specify* _____
- ☐ University Challenge Fund
- ☐ Investment Readiness Programme
- ☐ Regional Innovation Fund
- ☐ Venture Capital Trust
- ☐ HSBC Enterprise Fund *please specify* _____

☐ Baring English Growth Fund *please specify* _____

☐ local authority investment fund *please specify* _____

☐ other programmes or risk instruments *please specify* _____

04. Which sources of information are important for public VC-programmes? *(Please tick relevant box.)*

☐ support institutions ☐ ministries ☐ representative bodies (BVCA, EVCA etc.)

other *(please specify)* _____

05. Which of the following aspects of public programmes have caused you to make investments which otherwise would not have occurred?
(Please tick a number from 1 = very important to 6 = not important.)

	1	2	3	4	5	6
access to (not price reduced) refinancing loans	☐	☐	☐	☐	☐	☐
cheaper refinancing loans	☐	☐	☐	☐	☐	☐
risk-mitigation (guarantees)	☐	☐	☐	☐	☐	☐
public co-investment in investee companies	☐	☐	☐	☐	☐	☐
public co-investment in fund	☐	☐	☐	☐	☐	☐
other *(please specify)* _____	☐	☐	☐	☐	☐	☐

06. Please estimate the share of public finance (in the form of co-investment, re-finance or guarantees) in the overall investment made by you or your portfolio companies over the last three calendar years *(in percent)*

☐☐☐ %

07. In which regions and business stages did you very strongly refer to public finance? *(Please tick –multiple ticks possible.)*

Regions

☐ East Midlands ☐ East of England ☐ London
☐ North East ☐ North West ☐ Northern Ireland ☐ Scotland
☐ South East ☐ South West ☐ Wales ☐ West Midlands
☐ Yorkshire & the Humber

Business stage

☐ seed ☐ start-up ☐ expansion
☐ MBO / MBI ☐ replacement ☐ bridge ☐ turnaround

08. In which regions, phases, segments do you see a special need for public finance? *(Please tick –multiple ticks possible.)*

Regions

☐ East Midlands ☐ East of England ☐ London
☐ North East ☐ Northern Ireland ☐ North West ☐ Scotland
☐ South East ☐ South West ☐ Wales ☐ West Midlands
☐ Yorkshire & the Humber

Business stage

☐ seed ☐ start-up ☐ expansion
☐ MBO / MBI ☐ replacement ☐ bridge ☐ turnaround

Companies with yearly sales in £

☐ < £ 10 million ☐ £ 10–20 million ☐ £ 20–33 million
☐ £ 33–67 million ☐ > £ 67 million

Sectors

☐ IT, telecommunication, media ☐ other business & personal services ☐ manufacturing, high tech
☐ manufacturing, low tech, "old economy" ☐ life science ☐ other

Q9. Which of the following are important to improving public venture capital programmes? *(Please tick a number from 1 = very important to 6 = not important.)*

	1	2	3	4	5	6
the programmes of single institutions should be co-ordinated better with each other.	☐	☐	☐	☐	☐	☐
information on single programmes should be more easily accessible.	☐	☐	☐	☐	☐	☐
conditions of programmes should in general be much more attractive.	☐	☐	☐	☐	☐	☐
especially the support/aid limits (e.g. maximum volume) should be less restrictive.	☐	☐	☐	☐	☐	☐
the qualifying area (e.g. kind of financed proposal) should be wider defined.	☐	☐	☐	☐	☐	☐
the publicly (re-)financed share should increase.	☐	☐	☐	☐	☐	☐
decision process should be faster and less bureaucratic.	☐	☐	☐	☐	☐	☐
the ratio of turned down proposals by the public institutions should decrease.	☐	☐	☐	☐	☐	☐
the VC-programmes of this form should be stopped, because they are inefficient and / or support inefficient VC-companies.	☐	☐	☐	☐	☐	☐
other *(please specify)* _____	☐	☐	☐	☐	☐	☐

Q10. Do you have any suggestions as to how policy measures might enhance the venture capital market in the UK?

Q11. The DTI's new Regional Venture Capital Funds are designed to demonstrate that the provision of risk capital finance at the lower end of the market can be profitable and thereby encourage a greater supply of funding. Do you believe that such a 'demonstration effect' is likely to work? *(Please briefly explain your reply.)* ☐ yes ☐ no

Thank you for your help.

Please return the completed questionnaire in the envelope provided.

Bitte nicht heften oder lochen.
Bitte deutlich in blau oder schwarz ausfüllen.
Bitte nicht beantwortete Fragen nicht durchstreichen.

Teil A Allgemeine Unternehmensinformationen

Wir bitten Sie hier um allgemeine Informationen über Ihr Unternehmen.

A1. Zu welcher der folgenden Arten von Beteiligungsgesellschaften zählen Sie sich?
(Bitte kreuzen Sie an.)

☐ Corporate Venture Capital Gesellschaft (CVC) ☐ unabhängige Beteiligungsgesellschaft ☐ Mittelständische Beteiligungsgesellschaft (MBG) ☐ andere Förderinstitution

A2. In welchem Jahr hat Ihr Unternehmen in Deutschland die Geschäftstätigkeit aufgenommen? ☐☐☐☐

A3. Liegt der Hauptsitz Ihres Unternehmens in Deutschland? ☐ Ja ☐ Nein

A4. Wo befindet sich die (deutsche) Zentrale Ihres Unternehmens?
(Bitte tragen Sie entsprechend die ersten drei Stellen der Postleitzahl ein.) ☐☐☐

A5. Wie viele Niederlassungen / Büros hat ihr Unternehmen in Deutschland außerdem? ☐☐

A6. Wo befinden sich die Niederlassungen / Büros im Einzelnen? *(Bitte tragen Sie entsprechend die ersten drei Stellen der Postleitzahlen ein.)*

☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐
☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐

A7. Wie wichtig ist Ihnen die räumliche Nähe zu ... *(Bitte kreuzen Sie auf einer Skala von 1 = sehr wichtig bis 6 = unwichtig an.)*

	1	2	3	4	5	6
weiteren Beteiligungsgesellschaften	☐	☐	☐	☐	☐	☐
anderen Finanzdienstleistern	☐	☐	☐	☐	☐	☐
Ihren Beteiligungsunternehmen	☐	☐	☐	☐	☐	☐
tatsächlichen und potenziellen Kapitalgebern	☐	☐	☐	☐	☐	☐
wissenschaftlichen Einrichtungen	☐	☐	☐	☐	☐	☐
einem größeren Verdichtungsraum	☐	☐	☐	☐	☐	☐
Sonstigem *(Bitte genauer angeben.)* _____	☐	☐	☐	☐	☐	☐

A8. Welche der folgenden Veränderungen stehen bei Ihnen künftig an? *(Bitte kreuzen Sie an.)*

Wir werden die Anzahl unserer Investmentmanager ... ☐ aufstocken ☐ konstant halten ☐ abbauen

Wir werden unser „Zweigstellennetz" räumlich ... ☐ ausdehnen ☐ beibehalten ☐ einschränken

Wir werden fusionieren, Anteile anderer Beteiligungsgesellschaften erwerben, joint ventures und/oder strategische Allianzen mit anderen Beteiligungsgesellschaften eingehen. ☐ Ja ☐ Nein

A9. Woher stammte das Ihnen **im Jahr 2001** zur Verfügung stehende Kapital in etwa? *(Angabe in Prozent, Summe = 100%)*

☐☐☐ Geschäftsbanken *(in %)* ☐☐☐ Versicherungen *(in %)* ☐☐☐ Industrie *(in %)* ☐☐☐ Pensionsfonds *(in %)*

☐☐☐ konzerninterne Finanzierung *(in %)* ☐☐☐ Fonds in Fonds *(in %)* ☐☐☐ öffentlicher Sektor *(in %)* ☐☐☐ Privatpersonen *(in %)*

A10. Durch welche Eigenschaften ist die Eigentümerstruktur (der Managementgesellschaft) Ihres Unternehmens gekennzeichnet?
(Bitte kreuzen Sie an.)

☐ Kein Gesellschafter hält Anteile an unserer Management-gesellschaft von über 20%
☐ Ein Gesellschafter hält Anteile an unserer Managementgesellschaft zwischen 20% und 50%
☐ Ein Gesellschafter hält Anteile an unserer Managementgesellschaft von über 50%

A11. Ist der größte Anteilseigner Ihres Unternehmens ...

eine Geschäftsbank	eine Versicherung	ein Industrieunternehmen	eine Privatperson
☐ Ja ☐ Nein	☐ Ja ☐ Nein	☐ Ja ☐ Nein	☐ Ja ☐ Nein

ein (halb-)öffentlicher Träger ☐ Ja ☐ Nein

Sonstiges *(bitte angeben)* _____

Teil B Zu Ihrer Investitionstätigkeit

Hier bitten wir Sie um Informationen über die Art Ihrer Investitionstätigkeit.

B1. Wie wichtig schätzen Sie folgende Eigenschaften **Ihres Unternehmens** für die Akquisition eines Deals bzw. für Ihren Deal Flow ein?
(Bitte kreuzen Sie auf einer Skala von 1 = sehr wichtig bis 6 = unwichtig an.)

	1	2	3	4	5	6
eigener track record	☐	☐	☐	☐	☐	☐
eigene Reputation	☐	☐	☐	☐	☐	☐
eigene Netzwerke	☐	☐	☐	☐	☐	☐
Verständnis für technologische Probleme der Beteiligungsnehmer	☐	☐	☐	☐	☐	☐
persönliche Beziehung zu den Beteiligungsnehmern	☐	☐	☐	☐	☐	☐

B2. Wie viele Finanzierungs**anfragen** verzeichnete Ihr Unternehmen **im Jahr 2001** insgesamt? *(Bitte tragen Sie die Anzahl ein.)* ☐☐☐☐

B3. Wie viele Finanzierungsanfragen haben Sie davon einer intensiven Einzelfallprüfung unterzogen? *(Bitte tragen Sie die Anzahl ein.)* ☐☐☐☐

B4. Wie viele von den intensiv geprüften Anfragen aus dem Jahr 2001 haben Sie für akzeptabel befunden? *(Bitte tragen Sie die Anzahl ein.)* ☐☐☐

B5. Wie hoch war in etwa Ihre durchschnittliche **Investitionssumme** pro Beteiligung (Deal Size) in den **letzten drei Kalenderjahren**? *(in Mio €)* ☐☐☐,☐☐ *Mio €*

B6. Und wie hat sich die durchschnittliche Investitionssumme pro Beteiligung in den **letzten drei Kalenderjahren** entwickelt?
Der Deal Size hat tendenziell ... *(Bitte kreuzen Sie an.)*
☐ zugenommen ☐ sich nur unwesentlich verändert ☐ abgenommen

B7. Wie hoch ist in etwa der prozentuale Anteil der folgenden Investitionsgrößenklassen (Deal Size) an der Gesamtzahl Ihrer Investitionen in den **letzten drei Kalenderjahren**?
(Angabe in Prozent)

☐☐☐ < € 150.000 *(in %)*	☐☐☐ € 150.000–375.000 *(in %)*	☐☐☐ € 375.000–750.000 *(in %)*	
☐☐☐ € 750.000–1.500.000 *(in %)*	☐☐☐ € 1,5–5 Mio *(in %)*	☐☐☐ € 5–50 Mio *(in %)*	☐☐☐ > € 50 Mio *(in %)*

B8. Nimmt Ihr Unternehmen neben der reinen Kapitalbereitstellung bei den meisten Beteiligungen einen **wesentlichen** Einfluss auf die Geschäftsführung der Beteiligungsnehmer („hands on"-Betreuung)?
☐ Ja ☐ Nein

B9. Muss ein Kapital nachfragendes Unternehmen eine Mindestgröße aufweisen, damit Sie es für ein Engagement ernsthaft in Betracht ziehen?
(Bitte kreuzen Sie an.)
Ja, gemessen am Jahresumsatz muss ein Unternehmen eine Größe aufweisen von ...
☐ < € 5 Mio ☐ € 5–15 Mio ☐ € 15–30 Mio ☐ € 30–40 Mio ☐ € 40–50 Mio ☐ € 50–60 Mio ☐ > € 60 Mio
☐ Nein, eine Mindestgröße von Beteiligungsunternehmen spielt keine Rolle.

B10. Wie hoch ist in etwa Ihr durchschnittlicher Anteil folgender Finanzierungsformen an Ihren Bruttoinvestitionen der **letzten drei Kalenderjahre**?
(Angabe in Prozent)

☐☐☐ Direkte Beteiligungen (GmbH-Anteile, Kommanditeinlage, Aktien) *(in %)*	☐☐☐ Eigenkapitalnahe Mischformen (z.B. Stille Beteiligungen) *(in %)*
☐☐☐ Darlehensnahe Mischformen (z.B. nachrangige Darlehen) *(in %)*	☐☐☐ Sonstiges *(in %)*

B11. Wie hoch war in etwa der prozentuale Anteil folgender Finanzierungsphasen an Ihren Bruttoinvestitionen in den **letzten drei Kalenderjahren**?
(Angabe in Prozent)

☐☐☐ Seed *(in %)*	☐☐☐ Start-up *(in %)*	☐☐☐ Expansion *(in %)*
☐☐☐ MBO / MBI *(in %)*	☐☐☐ Bridge *(in %)*	☐☐☐ Replacement *(in %)*	☐☐☐ Turnaround *(in %)*

B12. Welche Mindest-Bruttorendite, d.h. vor Steuern und Risikoabschlägen, muss ein Neuengagement in etwa durchschnittlich versprechen, um von Ihnen Kapital zu erhalten? *(Bitte kreuzen Sie an.)*
☐ 4–8% ☐ 8–12% ☐ 12–16% ☐ 16–20% ☐ 20–24% ☐ 24–28% ☐ >28%

B13. Und wie hoch war **im Jahr 2001** die von Ihnen über das gesamte Engagement **realisierte** Rendite? *(Bitte kreuzen Sie an.)*
☐ < 0% ☐ 0–4% ☐ 4–8% ☐ 8–12% ☐ 12–16% ☐ 16–20% ☐ 20–24% ☐ >24%

B14. Wie hoch war in Ihrem Gesamtportfolio **im Jahr 2001** die Ausfallrate bezogen auf das insgesamt getätigte Investitionsvolumen und auf die entsprechende Anzahl von Unternehmen? *(Bitte kreuzen Sie an.)*

Volumen:	☐ 0–5%	☐ 5–10%	☐ 10–15%	☐ 15–25%	☐ >25%
Anzahl:	☐ 0–5%	☐ 5–10%	☐ 10–15%	☐ 15–25%	☐ >25%

B15. Ist Ihre Ausfallrate des Jahres **2001 gegenüber 1999** eher ... *(Bitte kreuzen Sie an.)*

☐ gestiegen ☐ gleich geblieben ☐ gesunken

B16. Wie haben sich **innerhalb Deutschlands** in etwa Ihre Bruttoinvestitionen in den **letzten drei Kalenderjahren** räumlich verteilt? *(Angabe in Prozent, Summe = 100%)*

___ Baden-Württemberg *(in %)*	___ Bayern *(in %)*	___ Berlin *(in %)*	___ Brandenburg *(in %)*
___ Bremen *(in %)*	___ Hamburg *(in %)*	___ Hessen *(in %)*	___ Mecklenburg-Vorpommern *(in %)*
___ Niedersachsen *(in %)*	___ Nordrhein-Westfalen *(in %)*	___ Rheinland-Pfalz *(in %)*	___ Saarland *(in %)*
___ Sachsen *(in %)*	___ Sachsen-Anhalt *(in %)*	___ Schleswig-Holstein *(in %)*	___ Thüringen *(in %)*

B17. Sind Sie auch Beteiligungen im Ausland eingegangen? ☐ Ja ☐ Nein

B18. *Wenn „ja"*, ist der Anteil Ihrer Auslandsengagements bezogen auf das Investitionsvolumen im Verlauf der **letzten drei Kalenderjahre** ... *(Bitte kreuzen Sie an.)*

☐ gestiegen ☐ gleich geblieben ☐ gesunken

B19. Wie hoch war in etwa der prozentuale Anteil folgender Sektoren an Ihren Bruttoinvestitionen in den **letzten drei Kalenderjahren**? *(Angabe in %)*

___ IT, Telekommunikation, Medien *(in %)*	___ Andere Dienstleistungen *(in %)*	___ Produzierendes Gewerbe, high tech *(in %,*
___ Produzierendes Gewerbe, low tech, „old economy" *(in %)*	___ Life Science *(in %)*	___ Andere Sektoren *(in %)*

B20. Hat sich im Verlaufe der **letzten drei Kalenderjahre** bei der Ausrichtung Ihrer Investitionstätigkeit in puncto Spezialisierung / Diversifizierung bezogen auf Finanzierungsphasen, Regionen, Sektoren und/oder Unternehmensgrößenklassen etwas geändert? *(Bitte kreuzen Sie für folgende Bereiche an.)*

Bereiche			
Finanzierungsphasen:	☐ zunehmende Spezialisierung	☐ zunehmende Diversifizierung	☐ weder noch
Regionen:	☐ zunehmende Spezialisierung	☐ zunehmende Diversifizierung	☐ weder noch
Sektoren:	☐ zunehmende Spezialisierung	☐ zunehmende Diversifizierung	☐ weder noch
Unternehmen einer bestimmten Größe:	☐ zunehmende Spezialisierung	☐ zunehmende Diversifizierung	☐ weder noch

B21. Bitte tragen Sie das ungefähre Volumen Ihrer investierten und nicht-investierten Fondsmittel **per 31.12.2001** ein. *(in Mio €)*

Investierte Mittel *Mio €* ___,___ Nicht-investierte Mittel *Mio €* ___,___

B22. Nutzen Sie ein systematisches Ratinginstrument – vergleichbar dem eines Kreditrating? ☐ Ja ☐ Nein

B23. *Wenn „ja"*, wie wichtig ist für Sie dieses Ratinginstrument ... *(Bitte kreuzen Sie auf einer Skala von 1 = sehr wichtig bis 6 = unwichtig an.)*

	1	2	3	4	5	6
zum Pre-Screening	☐	☐	☐	☐	☐	☐
zur Due Diligence	☐	☐	☐	☐	☐	☐
zum Monitoring und zur Betreuung der Targets	☐	☐	☐	☐	☐	☐

Teil C Zum Beteiligungsmarkt

Wir bitten Sie hier um allgemeine Aussagen über den Beteiligungsmarkt.

C1. Gibt es Ihrer Meinung nach Marktbereiche oder Regionen, in denen relativ zur Nachfrage ein dauerhaftes Unterangebot an Beteiligungskapital besteht? ☐ Ja ☐ Nein

C2. *Wenn „ja"*, wo können Sie gegebenenfalls derartige Marktlücken erkennen? *(Bitte kreuzen Sie jeweils an, Mehrfachnennungen möglich.)*

Sektoren			
	___ IT, Telekommunikation, Medien	___ Andere Dienstleistungen	___ Produzierendes Gewerbe, high tech
	___ Produzierendes Gewerbe, low tech, „old economy"	___ Life Science	___ Andere Sektoren

Finanzierungsphase

- ☐ Seed
- ☐ Start-up
- ☐ Expansion
- ☐ MBO / MBI
- ☐ Replacement
- ☐ Bridge
- ☐ Turnaround

Investitionssumme in €

- ☐ < €150.000
- ☐ €150.000–375.000
- ☐ €375.000–750.000
- ☐ €750.000–1.500.000
- ☐ €1,5–5 Mio
- ☐ €5–50 Mio
- ☐ > € 50 Mio

Unternehmen mit Jahresumsatz in €

- ☐ < € 15 Mio
- ☐ €15–30 Mio
- ☐ €30–50 Mio
- ☐ €50–100 Mio
- ☐ > € 100 Mio

Bundesländer

- ☐ Baden-Württemberg
- ☐ Bayern
- ☐ Berlin
- ☐ Brandenburg
- ☐ Bremen
- ☐ Hamburg
- ☐ Hessen
- ☐ Mecklenburg-Vorpommern
- ☐ Niedersachsen
- ☐ Nordrhein-Westfalen
- ☐ Rheinland-Pfalz
- ☐ Saarland
- ☐ Sachsen
- ☐ Sachsen-Anhalt
- ☐ Schleswig-Holstein
- ☐ Thüringen

C3. Wie sehr schränken folgende Faktoren die Investitionstätigkeit Ihres Unternehmens ein?
(Bitte kreuzen Sie auf einer Skala von 1 = sehr wichtig bis 6 = unwichtig an.)

	1	2	3	4	5	6
zu geringer Dealflow	☐	☐	☐	☐	☐	☐
Fehlen rentabler Deals	☐	☐	☐	☐	☐	☐
erwartetes Risiko liegt oberhalb der Toleranzgrenze	☐	☐	☐	☐	☐	☐
Probleme beim Erlangen von Informationen über Unternehmen	☐	☐	☐	☐	☐	☐
hoher Aufwand bei der Betreuung, Überwachung und Kontrolle von Unternehmen	☐	☐	☐	☐	☐	☐
Probleme beim Fundraising	☐	☐	☐	☐	☐	☐
hohe (fixe) Kosten der Evaluierung bzw. der Unternehmensprüfung	☐	☐	☐	☐	☐	☐
zu große geografische Entfernung zu den Targets	☐	☐	☐	☐	☐	☐
Fehlen von erfahrenen Investmentmanagern	☐	☐	☐	☐	☐	☐
verstopfte Exitwege	☐	☐	☐	☐	☐	☐
steuerliche Probleme *(bitte angeben)* _____	☐	☐	☐	☐	☐	☐
Sonstiges *(bitte angeben)* _____	☐	☐	☐	☐	☐	☐

Teil D Zu Förderprogrammen

Bitte teilen Sie uns zuletzt Ihre Erfahrungen und Ansichten hinsichtlich öffentlicher Fördermaßnahmen mit.

D1. Haben Sie im Verlauf der **letzten drei Kalenderjahre** öffentliche Beteiligungsförderprogramme genutzt? ☐ Ja ☐ Nein

D2. *Wenn „ja"*, von welchen Anbietern haben Sie öffentliche Programme genutzt? *(Bitte kreuzen Sie an, Mehrfachantworten möglich.)*

- ☐ KfW
- ☐ DtA (tbg, gbb)
- ☐ Mittelständische Beteiligungsgesellschaften
- ☐ Bundes- / Landesministerien
- Andere Länderinstitute *(bitte angeben)* _____
- ☐ EU
- Sonstige *(bitte angeben)* _____

03. Geben Sie bitte an, welche der folgenden Programme Sie bzw. Ihre Portfoliounternehmen in den letzten **drei Kalenderjahren *besonders*** häufig genutzt haben.

- ☐ KfW: BTU-Beteiligungskapital für kleine Technologieunternehmen (Refinanzierungsmodell)
- ☐ KfW: ERP-Innovationsprogramm-Beteiligungsvariante
- ☐ KfW: KfW-Beteiligungsfonds (Ost)
- ☐ KfW: ERP-Beteiligungsprogramm
- ☐ KfW: KfW-Risikokapitalprogramm (Garantieprogramm)
- ☐ KfW: KfW-Fondsfinanzierung
- ☐ tbg: BTU-Beteiligungskapital für kleine Technologieunternehmen (Koinvestmentvariante)
- ☐ tbg: tbg-Programm „BTU Frühphase"
- ☐ tbg: DtA-Technologie-Beteiligungsprogramm
- ☐ tbg: FUTOUR
- ☐ gbb: gbb Konsolidierungs- und Wachstumsfonds (Ost)
- ☐ Weitere Programme bzw. Risikoabsicherungsinstrumente *bitte angeben* _____

04. Welche Quellen sind nach Ihrer Erfahrung besonders wichtig, um Informationen über öffentliche Beteiligungsprogramme zu erhalten? *(Bitte kreuzen Sie an.)*

- ☐ Förderinstitute
- ☐ Ministerien
- ☐ Verbände (BVK, EVCA o.ä.)

Sonstige *(bitte angeben)* _____

05. Welche der folgenden Förderaspekte bewegen Sie dazu, Beteiligungen einzugehen, die Sie sonst nicht eingehen würden? *(Bitte kreuzen Sie auf einer Skala von 1 = sehr wichtig bis 6 = unwichtig an.)*

	1	2	3	4	5	6
Zugang zu (unverbilligten) Refinanzierungskrediten	☐	☐	☐	☐	☐	☐
Verbilligung bei der Refinanzierung	☐	☐	☐	☐	☐	☐
Risikoentlastung (Haftungsfreistellungen)	☐	☐	☐	☐	☐	☐
öffentliches Co-Investment in einzelne Unternehmen	☐	☐	☐	☐	☐	☐
öffentliches Co-Investment in Fonds	☐	☐	☐	☐	☐	☐
Sonstiges *(bitte angeben)* _____	☐	☐	☐	☐	☐	☐

06. Wie hoch schätzen Sie den prozentualen Anteil öffentlicher Finanzmittel (in Form von Beteiligungen, Refinanzierungen und Garantien) an den Gesamtinvestitionen ein, die Sie oder Ihre Portfoliounternehmen im Verlauf der **letzten drei Kalenderjahre** getätigt haben? *(Angabe in %)* ____ %

07. In welchen Bundesländern und Finanzierungsphasen haben Sie in den **letzten drei Kalenderjahren *besonders*** häufig öffentliche Finanzmittel eingesetzt? *(Bitte kreuzen Sie an, Mehrfachnennungen möglich.)*

Bundesländer

- ☐ Baden-Württemberg
- ☐ Bayern
- ☐ Berlin
- ☐ Brandenburg
- ☐ Bremen
- ☐ Hamburg
- ☐ Hessen
- ☐ Mecklenburg-Vorpommern
- ☐ Niedersachsen
- ☐ Nordrhein-Westfalen
- ☐ Rheinland-Pfalz
- ☐ Saarland
- ☐ Sachsen
- ☐ Sachsen-Anhalt
- ☐ Schleswig-Holstein
- ☐ Thüringen

Finanzierungsphase

- ☐ Seed
- ☐ Start-up
- ☐ Expansion
- ☐ MBO / MBI
- ☐ Replacement
- ☐ Bridge
- ☐ Turnaround

08. In welchen Regionen, Finanzierungshasen und Marktsegmenten sehen Sie besonderen Förderbedarf? *(Bitte kreuzen Sie an, Mehrfachnennungen möglich.)*

Bundesländer

- ☐ Baden-Württemberg
- ☐ Bayern
- ☐ Berlin
- ☐ Brandenburg
- ☐ Bremen
- ☐ Hamburg
- ☐ Hessen
- ☐ Mecklenburg-Vorpommern
- ☐ Niedersachsen
- ☐ Nordrhein-Westfalen
- ☐ Rheinland-Pfalz
- ☐ Saarland
- ☐ Sachsen
- ☐ Sachsen-Anhalt
- ☐ Schleswig-Holstein
- ☐ Thüringen

Finanzierungsphase

☐ Seed ☐ Start-up ☐ Expansion

☐ MBO / MBI ☐ Replacement ☐ Bridge ☐ Turnaround

Unternehmen mit Jahresumsatz in €

☐ < € 15 Mio ☐ € 15–30 Mio ☐ € 30–50 Mio

☐ € 50–100 Mio ☐ > € 100 Mio

Sektoren

☐ IT, Telekommunikation, Medien ☐ Andere Dienstleistungen ☐ Produzierendes Gewerbe, high tech

☐ Produzierendes Gewerbe, low tech, „old economy" ☐ Life Science ☐ Andere Sektoren

D9. Wo sehen Sie besonderen Verbesserungsbedarf bei öffentlichen Förderprogrammen?
(Bitte kreuzen Sie auf einer Skala von 1 = sehr wichtig bis 6 = unwichtig an.)

	1	2	3	4	5	6
Die Programme einzelner Anbieter sollten besser aufeinander abgestimmt sein.	☐	☐	☐	☐	☐	☐
Die Informationen über einzelne Programme müssten leichter zugänglich sein.	☐	☐	☐	☐	☐	☐
Die Konditionen der Förderprogramme müssten insgesamt attraktiver gestaltet werden.	☐	☐	☐	☐	☐	☐
Insbesondere sollten die Förderobergrenzen (z.B. die maximale Beteiligungssumme) weniger restriktiv sein.	☐	☐	☐	☐	☐	☐
Der Anwendungsbereich (z.B. Art der finanzierten Vorhaben) sollte weiter gefasst werden.	☐	☐	☐	☐	☐	☐
Der öffentlich (re-)finanzierte Anteil sollte steigen.	☐	☐	☐	☐	☐	☐
Der Vergabeprozess sollte schneller und unbürokratischer erfolgen.	☐	☐	☐	☐	☐	☐
Die Ablehnungsquote der Förderinstitute ist zu hoch.	☐	☐	☐	☐	☐	☐
Die existierenden Beteiligungsprogramme sollten in dieser Form generell eingestellt werden, weil sie ineffizient sind und/oder unrentable Beteiligungsgesellschaften unterstützen.	☐	☐	☐	☐	☐	☐
Weiteres *(bitte benennen)* _____	☐	☐	☐	☐	☐	☐

D10. Welche konkreten Vorschläge haben Sie zur Förderung des Beteiligungsmarktes in Deutschland?

Vielen Dank.

Bitte senden Sie den ausgefüllten Fragebogen im vorgesehenen Rückkuvert an uns zurück.

APPENDIX C

STATISTICAL PROBLEMS OF THE GAP PERCEPTION IN THE SURVEY AND THEIR TREATMENT

Sets of questions, with combinations of 'yes' but without 'no' boxes, can be ambiguous. In the seldom case that someone wrote 'none' or 'not applicable' for a specific market category this was interpreted as 'no' for all segments of the category. However, when none is ticked, this may mean that the respondent actively does not find some of the set relevant or it may mean that it was carelessly forgotten, omitted, or that the respondent does not know the answer. If there were 'no' boxes one could distinguish between both cases and calculate the valid distribution with higher percentages by omitting those that were 'missing'. This is not possible for the set of questions in C2, because 'no' boxes were here not entered in the questionnaire. It would not only have increased the space for the layout enormously but also the time required to fill out the questionnaire, so that respondents become reluctant to reply to these questions and go 'missing'. Only when there are optional 'no' boxes for each box offered, can one be absolutely precise about the issues involved to create a valid distribution.

The design of the questionnaire tends less towards precision with regard to this trade-off. It could, for example, have offered a 'no' box for each category. Yet, even in this case it would not be fully clear, whether a respondent, who ticked for example only one segment of the category, actively omitted other segments of this category or did not know an answer for these. However, the questions C1 and C2 are linked and one should use the same number of valid responses as a base for the distributions presented by excluding those that did not answer question C1, where a 'no' box exists, and hence did not answer any questions in C2 either. The original data sheet supports this assumption for 3 missing respondents in C1 in both countries. Altogether there were, however, 7 respondents 'missing' in C1. The remaining one of the 4 respondents 'missing' for Germany in C1, did select several gaps in C2, so that the answer in C1 must correctly be 'yes'. The data file for the findings presented in chapter 4 was hence adjusted

accordingly, so that there are only 3 missing for both countries. A further adjustment by deducting those respondents that answered 'yes' in C1 but did not select any segment in C2 could be incorrect. These respondents may perceive a supply gap, but not necessarily along the categories offered in C2. However, since all respondents who answered 'yes' in C1 ticked at least one segment in C2, such an adjustment was not only not possible, the response behaviour also demonstrates the high motivation of the survey respondents, verifies that the pre-defined categories were perceived as relevant and shows that the valid distributions used are appropriate. For coherency the same method and base was applied for the perceptions of normative funding gaps in D9 and for the strong reference to public finance in D7. The respondents, who were already missing in C1, have here again not identified any relevant market segment or category.

KfW (2003) provides a descriptive overview about some German findings with regard to C2. The findings about the segments of categories are related to the 70 respondents who answered C1 with 'yes'. Yet, 71 respondents answered to set of questions in C2, so that the correct result would be slightly lower. Important is, however, that these percentages can only provide an indication about the relative importance of categories or segments for one country. A comparison between both countries cannot be presented in this way because the percentages of respondents, who perceived a gap in one form or another (C1 or C2) are different in both countries. Hence these relative percentages could show a higher result in one country for a segment, even when the perception of a gap for this segment is lower.

For the relevance and rank of a category it is important that respondents who ticked 'yes' for several segments of one category are only counted once for this category. Respondents who ticked at least one other segment of the category but not a specific one were coded as 'no' for this segment. The overall number of respondents for one category is hence the sum of 'no' and 'yes' coded answers, which is, of course, the same for each segment of the category. Respondents who did not tick any segment of the category were coded as 'missing' or as 'n/a' according to their answer in C1.

Finally, it should be noted that respondents may have had the impression that gaps only exist in specific combinations, for example an early stage gap in Wales. However, it is hardly possible to design a questionnaire on a reasonable number of pages that covers all aspects of the gap perception and additionally provides scope to detect all potential combinations of it. And the results of this survey would in this case still present a perception of some form of a gap in Wales and a perception of some form of a gap in the 'early stage' category.

Correlations

Correlations

		Geographic proximity important: your investee companies	Largest owner: bank	Largest owner: (semi-) public body	Allocation to deal size class < E150th (%)	Allocation to deal size class E150-375th (%)	Does your co influence the management of the investee co?	Allocation to business stages: seed (%)	Allocation to business stages: start-up (%)	Expected minimum rate of return	Realised rate of return in 2001	Failure rate in relation to volume of investment in 2001	Failure rate in relation to number of companies in 2001	Allocation to economy sectors: manuf. high tech (%)	Do you use a systematic rating instrument?	Constraints: low dealflow	Constraints: lack of proposals with good returns	Constraints: perceived risk is too high	Constraints: lack of information on company	Constraints: difficulties in monitoring companies	Constraints: problems in fundraising	Constraints: high due diligence cost	Constraints: geographical remoteness of company	Constraints: shortage of staff with VC experience	Constraints: exit problems	Aspects: access to refinancing loans	Aspects: cheaper refinancing loans	Aspects: risk-mitigation (guarantees)	Aspects: public co-investment in companies	Aspects: public co-investment in fund	Share of public finance (%)	Reference to public finance: seed stage	Reference to public finance: start-up stage
Geographic proximity important: your investee companies	Pearson Correlation	1	,004	-,133	-,129	-,252**	-,102	-,201*	-,164*	,388**	,069	-,204*	-,282**	,081	-,109	,181*	,052	,048	,081	,130	,120	,092	,290**	,249**	,010	,139	,236*	,152	,221*	,155	-,279**	-,304**	-,317**
	Sig. (1-tailed)	.	,485	,090	,102	,006	,152	,021	,049	,000	,280	,026	,005	,211	,137	,033	,302	,316	,207	,094	,117	,180	,001	,005	,461	,098	,011	,070	,017	,070	,005	,005	,004
	N	106	103	103	98	98	103	103	103	90	74	92	82	100	103	103	104	102	103	104	101	102	104	104	105	89	93	95	93	92	85	70	70
Largest owner: bank	Pearson Correlation	,004	1	-,262**	-,015	-,007	-,252**	-,110	-,148	-,289**	-,135	,140	,132	-,009	-,004	,022	-,160	-,245**	-,151	-,163	,191*	-,062	-,008	-,105	,037	,038	-,055	-,116	,198*	,138	,008	,039	,098
	Sig. (1-tailed)	,485	.	,004	,441	,474	,005	,136	,070	,003	,127	,092	,122	,464	,483	,413	,054	,007	,068	,051	,029	,269	,467	,148	,355	,364	,303	,134	,030	,097	,478	,374	,209
	N	103	104	104	96	96	101	101	101	90	73	91	80	98	101	101	102	101	101	102	99	100	102	102	103	87	91	93	91	90	83	71	71
Largest owner: (semi-) public body	Pearson Correlation	-,133	-,262**	1	-,027	,143	-,084	-,059	,045	-,054	-,108	-,056	-,008	-,066	,128	-,041	-,001	-,159	-,212*	-,172*	,130	-,150	,142	,191*	,209*	,093	,016	-,096	-,115	-,088	,287**	-,130	,013
	Sig. (1-tailed)	,090	,004	.	,398	,082	,202	,278	,327	,274	,182	,298	,473	,259	,102	,341	,497	,056	,017	,042	,100	,068	,078	,027	,017	,195	,439	,179	,140	,205	,004	,141	,457
	N	103	104	104	96	96	101	101	101	90	73	91	80	98	101	101	102	101	101	102	98	100	102	102	103	87	91	93	91	90	83	71	71
Allocation to deal size class < E150th (%)	Pearson Correlation	-,129	-,015	-,027	1	,273**	-,181*	,025	-,121	-,341**	-,014	,006	,073	-,036	-,030	-,095	,063	-,014	-,025	-,007	-,057	,051	-,155	-,084	,153	-,093	-,193*	-,254**	-,195*	-,049	,457**	,071	,143
	Sig. (1-tailed)	,102	,441	,398	.	,003	,038	,403	,118	,001	,453	,477	,265	,364	,384	,179	,270	,448	,403	,473	,293	,311	,065	,208	,066	,200	,035	,008	,035	,325	,000	,285	,127
	N	98	96	96	99	99	97	98	98	84	71	87	77	95	96	96	97	96	96	97	94	95	97	97	98	84	88	89	87	87	80	68	68
Allocation to deal size class E150-375th (%)	Pearson Correlation	-,252**	-,007	,143	,273**	1	-,319**	,384**	-,070	-,530**	-,094	,026	,156	,232*	,067	-,056	,053	-,093	-,112	-,108	-,122	-,172*	-,236**	-,066	,139	,011	-,148	-,300**	-,133	,068	,505**	,046	-,023
	Sig. (1-tailed)	,006	,474	,082	,003	.	,001	,000	,247	,000	,217	,404	,068	,012	,259	,293	,302	,184	,139	,147	,122	,048	,010	,259	,087	,462	,087	,002	,109	,265	,000	,356	,428
	N	98	96	96	99	99	97	98	98	84	71	87	77	95	96	96	97	96	98	97	94	95	97	97	98	84	88	89	87	87	80	68	68
Does your co influence the management of the investee co?	Pearson Correlation	-,102	-,252**	-,084	-,181*	-,319**	1	,137	,201*	,480**	,057	,079	,075	-,013	,049	-,061	-,013	,113	,155	-,006	-,131	,099	,089	,019	-,177*	-,256**	-,006	,088	-,059	-,191*	-,302**	,180	-,021
	Sig. (1-tailed)	,152	,005	,202	,038	,001	.	,086	,022	,000	,317	,228	,255	,449	,313	,272	,450	,132	,061	,478	,097	,163	,244	,423	,037	,008	,478	,201	,290	,036	,000	,069	,430
	N	103	101	101	97	97	104	101	101	89	73	90	80	98	101	101	102	100	101	102	99	100	102	102	103	87	91	93	91	90	84	70	70
Allocation to business stages: seed (%)	Pearson Correlation	-,201*	-,110	-,059	,025	,384**	,137	1	,011	-,019	-,048	,177*	,292**	,161	,013	,073	,137	,190*	,216*	,032	-,258**	-,069	,072	-,090	-,148	-,112	,046	,019	-,026	-,100	,040	,511**	,065
	Sig. (1-tailed)	,021	,136	,278	,403	,000	,086	.	,456	,431	,346	,046	,004	,054	,448	,234	,085	,029	,015	,374	,005	,247	,237	,184	,070	,149	,331	,430	,404	,172	,359	,000	,298
	N	103	101	101	98	98	101	104	104	89	73	92	81	100	101	101	102	100	101	102	99	101	102	102	103	88	92	93	91	91	83	70	70
Allocation to business stages: start-up (%)	Pearson Correlation	-,164*	-,148	,045	-,121	-,070	,201*	,011	1	,205*	-,145	,256**	,209*	,196*	,108	,060	,015	,195*	,162	-,005	-,108	,239**	-,036	-,031	-,186*	-,073	-,014	,056	-,167	-,051	,034	,271**	,450**
	Sig. (1-tailed)	,049	,070	,327	,118	,247	,022	,456	.	,027	,110	,007	,031	,026	,141	,276	,442	,026	,053	,480	,144	,008	,360	,378	,030	,249	,445	,298	,056	,315	,379	,012	,000
	N	103	101	101	98	98	101	104	104	89	73	92	81	100	101	101	102	100	101	102	99	101	102	102	103	88	92	93	91	91	83	70	70
Expected minimum rate of return	Pearson Correlation	,388**	-,289**	-,054	-,341**	-,530**	,480**	-,019	,205*	1	,208*	-,175	-,127	,031	-,130	,097	,051	,219*	,241*	,196*	-,009	,179*	,097	,195*	-,284**	-,023	,305**	,401**	,047	-,197**	-,539**	,023	-,163
	Sig. (1-tailed)	,000	,003	,274	,001	,000	,000	,431	,027	.	,041	,055	,136	,389	,113	,184	,315	,021	,012	,032	,467	,048	,184	,033	,003	,421	,003	,000	,340	,040	,000	,430	,102
	N	90	90	90	84	84	89	89	89	91	71	85	75	86	89	88	90	87	89	89	87	88	89	89	91	77	81	82	81	80	74	63	63
Realised rate of return in 2001	Pearson Correlation	,069	-,135	-,108	-,014	-,094	,057	-,046	-,145	,208*	1	-,324**	-,176	,029	-,067	,094	,225*	,197*	,096	,257*	-,101	-,018	-,057	-,069	,065	,194	-,133	,113	-,103	-,236*	-,031	,045	-,093
	Sig. (1-tailed)	,280	,127	,182	,453	,217	,317	,348	,110	,041	.	,003	,083	,406	,286	,218	,028	,049	,207	,015	,204	,438	,318	,312	,293	,084	,142	,181	,206	,028	,408	,374	,255
	N	74	73	73	71	71	73	73	73	71	74	70	63	76	73	71	73	72	72	72	69	70	72	72	73	53	67	67	66	66	59	53	53
Failure rate in relation to volume of investment in 2001	Pearson Correlation	-,204*	,140	-,058	,006	,026	,079	,177*	,256**	-,175	-,324**	1	,871**	-,680	-,009	,003	-,051	-,149	-,012	-,127	-,247**	,006	,045	-,162	-,184*	-,132	-,077	-,243*	-,122	-,046	,141	,412**	,262*
	Sig. (1-tailed)	,026	,092	,298	,477	,404	,228	,046	,007	,055	,003	.	,000	,229	,467	,489	,314	,080	,455	,114	,010	,477	,336	,081	,040	,118	,239	,012	,132	,338	,111	,000	,019
	N	92	91	91	87	87	90	92	92	85	70	93	80	88	90	91	92	90	92	92	89	91	92	92	92	82	86	85	85	85	77	63	63
Failure rate in relation to number of companies in 2001	Pearson Correlation	-,282**	,132	-,008	,073	,156	,075	,293**	,209*	-,127	-,176	,871**	1	-,113	-,024	,118	,081	,061	,066	-,077	-,198*	-,029	-,014	-,176	-,179	-,323**	-,171	-,328**	-,188	-,169	,174	,375**	,318**
	Sig. (1-tailed)	,005	,122	,473	,265	,063	,258	,004	,031	,138	,083	,000	.	,164	,417	,150	,235	,296	,278	,247	,040	,399	,451	,059	,055	,003	,069	,002	,053	,073	,077	,002	,008
	N	82	80	80	77	77	80	81	81	75	63	80	82	77	79	80	81	79	81	81	79	81	81	81	81	73	78	78	75	75	68	56	56
Allocation to economy sectors: manuf. high tech (%)	Pearson Correlation	,081	-,009	-,066	-,036	,232*	-,013	,161	,196*	,031	,029	-,080	-,113	1	,050	,100	,144	,223*	,171*	,090	,097	,183*	,124	,008	,065	-,048	,035	,147	-,127	-,030	,066	,224	-,028
	Sig. (1-tailed)	,211	,464	,258	,364	,012	,449	,054	,026	,388	,406	,229	,164	.	,312	,163	,078	,014	,046	,188	,173	,037	,111	,477	,261	,332	,374	,084	,120	,301	,290	,423	,410
	N	100	98	98	95	95	98	100	100	86	70	88	77	101	98	98	99	97	98	99	97	97	99	99	100	85	89	90	88	88	81	67	67
Do you use a systematic rating instrument?	Pearson Correlation	-,109	-,004	,128	-,030	,067	,049	,013	,108	-,130	-,067	-,009	-,024	,050	1	,203*	-,035	,074	-,021	,071	,000	,035	,004	-,138	-,028	,121	-,148	,060	,035	,089	,331**	-,190	,050
	Sig. (1-tailed)	,137	,483	,102	,384	,259	,313	,448	,141	,113	,286	,467	,417	,312	.	,021	,362	,233	,419	,238	,500	,364	,483	,083	,389	,133	,080	,284	,372	,203	,001	,059	,340
	N	103	101	101	96	96	101	101	101	89	73	90	79	98	104	101	102	100	101	102	99	100	102	102	103	87	91	93	91	90	83	68	68
Constraints: low dealflow	Pearson Correlation	,181*	,022	-,041	-,095	-,056	-,061	,073	,060	,097	,094	,003	,118	,100	,203*	1	,536**	,233**	,263**	,173*	,023	,049	,099	,068	,060	-,065	,032	,023	,066	,063	-,005	,053	,049	-,060
	Sig. (1-tailed)	,033	,413	,341	,179	,293	,272	,234	,276	,184	,218	,489	,150	,163	,021	.	,000	,009	,004	,039	,410	,313	,158	,247	,275	,364	,412	,204	,214	,483	,318	,344	,232
	N	103	101	101	96	96	101	101	101	88	71	91	80	98	101	103	103	101	103	104	100	101	104	104	103	89	93	94	93	92	84	69	69
Constraints: lack of proposals with good returns	Pearson Correlation	,052	-,160	-,001	,063	,053	-,013	,137	,015	,051	,225*	-,051	,081	,144	-,035	,536**	1	,409**	,201*	,241**	-,143	,044	,114	,034	,047	-,078	-,089	,055	-,078	-,153	,086	,021	-,066
	Sig. (1-tailed)	,302	,054	,497	,270	,302	,450	,085	,442	,315	,028	,314	,235	,078	,362	,000	.	,000	,020	,007	,077	,332	,124	,366	,319	,234	,199	,300	,234	,073	,217	,431	,240
	N	104	102	102	97	97	102	102	102	90	73	92	81	99	102	103	105	102	104	104	100	101	104	104	104	89	93	94	93	92	85	69	69
Constraints: perceived risk is too high	Pearson Correlation	,048	-,245**	-,159	-,014	-,093	,113	,190*	,195*	,219*	,197*	-,149	-,061	,222*	,074	,233**	,409**	1	,517**	,425**	,082	,164	,142	,034	,050	-,148	,003	,197*	,049	-,068	-,063	,036	,041
	Sig. (1-tailed)	,316	,007	,056	,448	,184	,132	,029	,026	,021	,049	,080	,296	,014	,233	,009	,000	.	,000	,000	,212	,052	,077	,368	,307	,086	,489	,029	,322	,268	,304	,385	,368
	N	102	101	101	96	96	100	100	100	87	72	90	79	97	100	101	102	103	101	102	98	99	102	102	102	87	91	93	91	90	82	69	69
Constraints: lack of information on company	Pearson Correlation	,081	-,151	-,212*	-,025	-,112	,155	,216*	,162	,241*	,096	-,012	,066	,171*	-,021	,263**	,201*	,517**	1	,492**	,051	,435**	,259**	,141	,027	-,139	,119	,230*	,003	,021	-,133	,144	,065
	Sig. (1-tailed)	,207	,066	,017	,403	,139	,061	,015	,053	,012	,207	,455	,278	,046	,419	,004	,020	,000	.	,000	,307	,000	,004	,077	,293	,097	,129	,013	,378	,420	,112	,121	,300
	N	103	101	101	96	96	101	101	101	89	72	92	81	98	101	103	104	101	104	104	100	101	104	104	103	89	93	93	93	92	85	68	68
Constraints: difficulties in monitoring companies	Pearson Correlation	,130	-,163	-,172*	-,007	-,108	-,006	,032	-,005	,196*	,257*	-,127	-,077	,090	,071	,173*	,241**	,425**	,492**	1	,074	,411**	,142	,176*	,051	,029	-,004	,376**	,191*	,140	-,178	-,140	-,029
	Sig. (1-tailed)	,094	,051	,042	,473	,147	,478	,374	,480	,032	,015	,114	,247	,189	,239	,039	,007	,000	,000	.	,231	,000	,074	,036	,303	,395	,485	,000	,033	,092	,054	,126	,408
	N	104	102	102	97	97	102	102	102	89	72	92	81	99	102	104	104	102	104	105	101	102	105	105	104	89	93	94	93	92	85	69	69
Constraints: problems in fundraising	Pearson Correlation	,120	,191*	,130	-,057	-,122	-,131	,258**	-,108	-,009	-,101	-,247**	-,198*	,097	,000	,023	-,143	-,082	,051	,074	1	,151	-,038	,190*	,254**	,182*	,155	-,026	,161*	,194*	-,067	,193	,092
	Sig. (1-tailed)	,117	,029	,100	,293	,122	,097	,005	,144	,467	,204	,010	,040	,173	,500	,410	,077	,212	,307	,231	.	,068	,358	,028	,005	,045	,072	,404	,043	,033	,302	,060	,232
	N	101	99	99	94	94	99	99	99	87	69	89	79	97	99	100	100	98	100	101	102	101	101	101	101	88	90	91	91	90	84	66	66
Constraints: high due diligence cost	Pearson Correlation	,092	-,062	-,150	,051	-,172*	,099	-,069	,239**	,179*	-,019	,006	-,029	,183*	,035	,049	,044	,164	,435**	,411**	,151	1	,205*	,269**	,026	-,033	,024	,325**	,061	,198*	-,053	,176	,347**
	Sig. (1-tailed)	,180	,269	,068	,311	,048	,163	,247	,008	,048	,439	,477	,399	,037	,364	,313	,332	,052	,000	,000	,066	.	,019	,003	,369	,380	,412	,001	,282	,031	,316	,076	,002
	N	102	100	100	95	95	100	101	101	88	70	91	81	97	100	101	101	99	101	102	101	103	102	102	102	88	91	92	91	90	84	68	68
Constraints: geographical remoteness of company	Pearson Correlation	,290**	-,008	,142	-,155	-,236**	,069	-,072	-,036	,097	-,057	,045	-,014	,124	,004	,099	,114	,142	,259**	,142	-,036	,205*	1	,066	,248**	,028	,030	,210*	,215*	,062	-,122	-,052	-,071
	Sig. (1-tailed)	,001	,467	,078	,065	,010	,244	,237	,360	,184	,318	,336	,451	,111	,483	,158	,124	,077	,004	,074	,358	,019	.	,252	,005	,396	,388	,021	,019	,277	,133	,336	,282
	N	104	102	102	97	97	102	102	102	89	72	92	81	99	102	104	104	102	104	105	101	102	105	105	104	89	93	94	93	92	85	69	69
Constraints: shortage of staff with VC experience	Pearson Correlation	,249**	-,105	,191*	-,084	-,066	,019	-,090	-,031	,195*	-,059	-,162	-,178	,008	-,138	,068	,034	,034	,141	,176*	,190*	,269**	,066	1	,125	,211*	,292**	,237*	,099	,053	-,157	-,040	-,227*
	Sig. (1-tailed)	,005	,148	,027	,208	,259	,423	,184	,378	,033	,312	,061	,056	,477	,083	,247	,366	,368	,077	,036	,028	,003	,252	.	,102	,023	,002	,011	,174	,307	,076	,372	,033
	N	104	102	102	97	97	102	102	102	89	72	92	81	99	102	104	104	102	104	105	101	102	105	105	104	89	93	94	93	92	85	69	69
Constraints: exit problems	Pearson Correlation	,010	,037	,209*	,153	,139	-,177*	-,146	-,186*	-,288**	-,065	-,184*	-,179	,065	-,028	-,060	,047	,050	,027	,051	,254**	,026	,248**	,125	1	,213*	,019	,083	,171	,211*	,127	,298**	-,055
	Sig. (1-tailed)	,461	,355	,017	,066	,087	,037	,070	,030	,003	,293	,040	,055	,261	,389	,275	,319	,307	,383	,303	,005	,399	,006	,102	.	,022	,429	,211	,050	,022	,124	,006	,326
	N	105	103	103	98	98	103	103	103	91	73	92	81	100	103	103	104	102	103	104	101	102	104	104	106	89	93	95	93	92	85	71	71
Aspects: access to refinancing loans	Pearson Correlation	,139	,038	,093	-,093	,011	-,259**	-,112	-,073	-,023	-,194	-,132	-,323**	-,048	,121	,032	-,078	-,148	-,139	,029	,182*	-,033	,028	,211*	,213*	1	,651**	,374**	,373**	,411**	-,067	-,140	-,229*
	Sig. (1-tailed)	,096	,364	,195	,200	,482	,008	,149	,249	,421	,064	,118	,003	,332	,133	,384	,234	,086	,097	,395	,045	,380	,396	,023	,022	.	,000	,000	,000	,000	,281	,138	,037
	N	89	87	87	84	84	87	88	88	77	63	82	73	85	87	89	89	87	89	89	88	88	89	89	90	90	89	90	90	89	77	62	62
Aspects: cheaper refinancing loans	Pearson Correlation	,236*	-,055	,016	-,193*	-,146	-,006	,046	-,014	,305**	-,133	-,077	-,171	,035	-,148	,023	-,089	,003	,119	-,004	,155	,024	,030	,292**	,019	,651**	1	,468**	,374**	,344**	-,337**	,030	-,175
	Sig. (1-tailed)	,011	,303	,439	,035	,087	,476	,331	,445	,003	,142	,239	,069	,374	,080	,412	,199	,489	,129	,485	,072	,412	,388	,002	,429	,000	.	,000	,000	,000	,001	,407	,080
	N	93	91	91	88	88	91	92	92	81	67	86	76	89	91	93	93	91	93	93	90	91	93	93	93	90	94	93	93	93	80	66	66
Aspects: risk-mitigation (guarantees)	Pearson Correlation	,152	-,116	-,096	-,254**	-,300**	,480**	-,088	,019	,056	,401**	,113	-,243*	-,328**	,147	,060	,086	,055	,197*	,230*	,376**	-,026	,325**	,210*	,237*	,083	,374**	,468**	1	,406**	,300**	-,307**	,042	-,135
	Sig. (1-tailed)	,070	,134	,179	,008	,002	,000	,201	,430	,298	,000	,181	,012	,002	,084	,284	,204	,300	,029	,013	,000	,404	,001	,021	,011	,211	,000	,000	.	,000	,002	,000	,367	,137
	N	95	93	93	89	89	93	93	93	82	67	85	76	90	93	94	94	93	93	94	91	92	94	94	95	89	93	96	93	92	80	68	68
Aspects: public co-investment in companies	Pearson Correlation	,221*	,198*	-,115	-,195*	-,133	-,059	-,026	-,167	,047	-,100	-,122	-,188	-,127	,035	,083	-,076	,049	,033	,191*	,181*	,061	,215*	,099	,171	,373**	,374**	,406**	1	,623**	-,265**	-,100	-,161
	Sig. (1-tailed)	,017	,030	,140	,035	,109	,290	,404	,056	,340	,206	,132	,053	,120	,372	,214	,234	,322	,378	,033	,043	,282	,019	,174	,050	,000	,000	,000	.	,000	,009	,213	,099
	N	93	91	91	87	87	91	91	91	81	66	85	75	88	91	93	93	91	93	93	91	91	93	93	93	90	93	93	93	93	80	66	66
Aspects: public co-investment in fund	Pearson Correlation	,155	,138	-,088	-,049	,068	-,191*	-,100	-,051	-,197*	-,236*	-,046	-,169	-,030	,089	-,005	-,153	-,066	,021	,140	,194*	,198*	,062	,053	,211*	,411**	,344**	,300**	,623**	1	-,052	-,152	,110
	Sig. (1-tailed)	,070	,097	,205	,325	,255	,038	,172	,315	,040	,028	,338	,073	,391	,203	,483	,073	,268	,420	,092	,033	,031	,277	,307	,022	,000	,000	,003	,000	.	,323	,113	,192
	N	92	90	90	87	87	90	91	91	80	66	85	75	88	90	92	92	90	92	92	90	90	92	92	92	90	93	92	93	93	79	65	65
Share of public finance (%)	Pearson Correlation	-,279**	,006	,287**	,457**	,505**	-,302**	,040	,034	-,539**	-,031	,141	,174	,056	,331**	,053	,086	,063	-,133	-,176	-,057	-,053	-,122	-,157	,127	-,067	-,337**	-,307**	-,265**	-,052	1	,116	,238*
	Sig. (1-tailed)	,005	,478	,004	,000	,000	,003	,359	,379	,000	,408	,111	,077	,280	,001	,318	,217	,284	,112	,054	,302	,316	,133	,076	,124	,281	,001	,003	,009	,323	.	,185	,031
	N	85	83	83	80	80	84	83	83	74	59	77	68	81	83	84	85	82	85	85	84	84	85	85	85	77	80	80	80	79	86	62	62
Reference to public finance: seed stage	Pearson Correlation	-,304**	,039	-,130	,071	,046	,180	,511**	,271*	,023	,045	,412**	,375**	,024	-,190	,049	,021	,036	,144	-,140	-,193	,176	-,052	-,040	-,298**	-,140	,030	,042	-,100	-,152	,116	1	,243*
	Sig. (1-tailed)	,005	,374	,141	,285	,358	,069	,000	,012	,430	,374	,000	,002	,423	,059	,344	,431	,385	,121	,126	,060	,075	,325	,372	,006	,138	,407	,367	,213	,113	,185	.	,021
	N	70	71	71	66	66	70	70	70	63	53	63	56	67	69	69	69	68	69	69	68	68	69	68	71	62	66	66	66	65	71	71	71
Reference to public finance: start-up stage	Pearson Correlation	-,317**	,098	,013	,143	-,023	-,021	,065	,450**	-,163	-,093	,262*	,318**	-,028	,050	-,090	-,086	,041	,065	-,029	,092	,347**	-,071	-,222*	-,055	-,229*	-,175	-,135	-,161	,099	,192	,021	,021
	Sig. (1-tailed)	,004	,209	,457	,

Nonparametric Correlations

Correlations

			Geographic proximity important: your investee companies	Largest owner: bank	Largest owner: (semi-) public body	Does your co influence the management of the investee co?	Expected minimum rate of return	Realised rate of return in 2001	Failure rate in relation to volume of investment in 2001	Failure rate in relation to number of companies in 2001	Do you use a systematic rating instrument?	Constraints: low dealflow	Constraints: lack of proposals with good returns	Constraints: perceived risk is too high	Constraints: lack of information on company	Constraints: difficulties in monitoring companies	Constraints: problems in fundraising	Constraints: high due diligence cost	Constraints: geographical remoteness of company	Constraints: shortage of staff with VC experience	Constraints: exit problems	Aspects: access to refinancing loans	Aspects: cheaper refinancing loans	Aspects: risk-mitigation (guarantees)	Aspects: public co-investment in companies	Aspects: public co-investment in fund	Reference to public finance: seed stage	Reference to public finance: start-up stage	Involved with public VC in last 3 years?
Kendall's tau_b	Geographic proximity important: your investee companies	Correlation Coefficient	1,000	-,025	-,173*	-,063	,338**	,119	-,220**	-,264**	-,081	,115	,065	,088	,039	,124	,041	,051	,243**	,204**	,013	,089	,208**	,229**	,214**	,154*	-,279**	-,244**	-,148*
		Sig. (1-tailed)	.	,390	,029	,244	,000	,112	,006	,002	,186	,077	,213	,146	,316	,062	,307	,268	,001	,006	,434	,158	,008	,004	,007	,039	,006	,014	,048
		N	106	103	103	103	90	74	92	82	103	103	104	102	103	104	101	102	104	104	105	89	93	95	93	92	70	70	106
	Largest owner: bank	Correlation Coefficient	-,025	1,000	-,262**	-,252**	-,229**	-,099	,126	,117	-,004	,012	-,150*	-,222**	-,126	-,144	,177*	-,060	,008	-,053	,039	,031	-,059	-,107	,174*	,121	,039	,098	-,002
		Sig. (1-tailed)	,390	.	,004	,006	,007	,173	,096	,127	,483	,449	,048	,008	,081	,052	,025	,255	,466	,278	,330	,374	,284	,131	,033	,103	,373	,207	,494
		N	103	104	104	101	90	73	91	80	101	101	102	101	101	102	99	100	102	102	103	87	91	93	91	90	71	71	104
	Largest owner: (semi-) public body	Correlation Coefficient	-,173*	-,262**	1,000	-,084	-,048	-,093	-,019	-,001	,128	-,043	,003	-,133	-,178*	-,151*	,114	-,146	,151*	,160*	,163*	,108	,027	-,101	-,108	-,065	-,130	,013	,110
		Sig. (1-tailed)	,029	,004	.	,201	,304	,188	,422	,494	,101	,313	,487	,072	,024	,044	,103	,055	,044	,037	,033	,132	,387	,144	,127	,248	,139	,456	,132
		N	103	104	104	101	90	73	91	80	101	101	102	101	101	102	99	100	102	102	103	87	91	93	91	90	71	71	104
	Does your co influence the management of the investee co?	Correlation Coefficient	-,063	-,252**	-,084	1,000	,416**	-,024	,054	,041	,049	-,029	-,012	,020	,136	-,008	-,104	,079	,049	,026	-,148*	-,233**	-,013	,072	-,065	-,157	,180	-,021	,070
		Sig. (1-tailed)	,244	,006	,201	.	,000	,412	,290	,344	,312	,374	,448	,412	,065	,463	,124	,192	,292	,385	,047	,008	,447	,225	,248	,051	,068	,429	,240
		N	103	101	101	104	89	73	90	80	101	101	102	100	101	102	99	100	102	102	103	87	91	93	91	90	70	70	104
	Expected minimum rate of return	Correlation Coefficient	,338**	-,229**	-,048	,416**	1,000	,064	-,176*	-,139	-,107	,117	,025	,180*	,163*	,147*	,005	,144*	,037	,143*	-,181*	-,049	,226**	,356**	,018	-,131	,025	-,150	-,035
		Sig. (1-tailed)	,000	,007	,304	,000	.	,249	,024	,069	,130	,084	,386	,020	,028	,073	,475	,048	,332	,046	,015	,298	,005	,000	,421	,074	,414	,093	,355
		N	90	90	90	89	91	71	85	75	89	88	90	87	89	39	87	88	89	89	91	77	81	82	81	80	63	63	91
	Realised rate of return in 2001	Correlation Coefficient	,119	-,099	-,093	-,024	,064	1,000	-,304**	-,180*	-,006	,098	,210*	,136	,033	,179*	-,138	-,043	-,086	-,103	-,004	-,151	-,163*	,099	-,048	-,116	,012	-,108	-,260**
		Sig. (1-tailed)	,112	,173	,188	,412	,249	.	,001	,039	,476	,154	,014	,081	,364	,030	,076	,331	,185	,141	,482	,071	,050	,166	,317	,123	,461	,195	,004
		N	74	73	73	73	71	74	70	63	73	71	73	72	72	72	69	70	72	72	73	63	67	67	66	66	53	53	74
	Failure rate in relation to volume of investment in 2001	Correlation Coefficient	-,220**	,126	-,019	,054	-,176*	-,304**	1,000	,817**	,008	,024	-,020	-,148*	-,015	-,109	-,181*	,009	,027	-,128	-,181*	-,101	-,107	-,325**	-,139	-,089	,352**	,252*	,358**
		Sig. (1-tailed)	,006	,096	,422	,290	,024	,001	.	,000	,466	,389	,409	,046	,432	,101	,018	,457	,378	,066	,017	,136	,113	,000	,060	,162	,001	,014	,000
		N	92	91	91	90	85	70	93	80	90	91	92	90	92	92	89	91	92	92	92	82	86	85	85	85	63	63	93
	Failure rate in relation to number of companies in 2001	Correlation Coefficient	-,264**	,117	-,001	,041	-,139	-,180*	,817**	1,000	-,017	,094	,053	-,065	,029	-,080	-,119	-,017	-,027	-,156*	-,143	-,242**	-,164*	-,367**	-,162**	-,135	,325**	,304**	,336**
		Sig. (1-tailed)	,002	,127	,494	,344	,069	,039	,000	.	,436	,153	,283	,242	,376	,189	,098	,427	,384	,045	,057	,006	,040	,000	,044	,079	,004	,006	,000
		N	82	80	80	80	75	63	80	82	79	80	81	79	81	81	79	81	81	81	81	73	76	76	75	75	56	56	82
	Do you use a systematic rating instrument?	Correlation Coefficient	-,081	-,004	,128	,049	-,107	-,006	,008	-,017	1,000	,183*	,003	,070	-,023	,064	-,027	,025	,033	-,137	-,055	,071	-,134	,034	,029	,030	-,190	,050	,183*
		Sig. (1-tailed)	,186	,483	,101	,312	,130	,476	,466	,436	.	,020	,485	,221	,398	,234	,380	,391	,356	,063	,287	,232	,077	,362	,381	,375	,059	,339	,031
		N	103	101	101	101	89	73	90	79	104	101	102	100	101	102	99	100	102	102	103	87	91	93	91	90	69	69	104
	Constraints: low dealflow	Correlation Coefficient	,115	,012	-,043	-,029	,117	,098	,024	,094	,183*	1,000	,452**	,196**	,189**	,148*	,020	,040	,067	,073	-,086	-,006	,005	,058	,078	,006	,070	-,097	,148*
		Sig. (1-tailed)	,077	,449	,313	,374	,084	,154	,389	,153	,020	.	,000	,008	,009	,031	,399	,310	,196	,179	,137	,471	,474	,248	,181	,477	,260	,187	,046
		N	103	101	101	101	88	71	91	80	101	104	103	101	103	104	100	101	104	104	103	89	93	94	93	92	69	69	104
	Constraints: lack of proposals with good returns	Correlation Coefficient	,065	-,150*	,003	-,012	,025	,210*	-,020	,053	,003	,452**	1,000	,363**	,187**	,194**	-,114	,031	,032	,026	,041	-,091	-,038	,075	-,057	-,064	,023	-,060	,117
		Sig. (1-tailed)	,213	,048	,487	,448	,386	,014	,409	,283	,485	,000	.	,000	,010	,007	,080	,353	,343	,375	,302	,149	,324	,192	,251	,165	,417	,292	,095
		N	104	102	102	102	90	73	92	81	102	103	105	102	104	104	100	101	104	104	104	89	93	94	93	92	69	69	105
	Constraints: perceived risk is too high	Correlation Coefficient	,088	-,222**	-,133	,020	,180*	,136	-,148*	-,065	,070	,196**	,363**	1,000	,416**	,314**	-,076	,078	,043	-,048	-,011	-,114	-,002	,102	,025	-,067	,049	,051	-,053
		Sig. (1-tailed)	,146	,008	,072	,412	,020	,081	,046	,242	,221	,008	,000	.	,000	,000	,181	,247	,297	,279	,447	,099	,491	,120	,395	,221	,329	,312	,279
		N	102	101	101	100	87	72	90	79	100	101	102	103	101	102	98	99	102	102	102	87	91	93	91	90	69	69	103
	Constraints: lack of information on company	Correlation Coefficient	,039	-,126	-,178*	,136	,163*	,033	-,015	,029	-,023	,189**	,187**	,416**	1,000	,408**	,058	,349**	,181*	,145*	,018	-,106	,093	,152*	,029	,038	,120	,052	,101
		Sig. (1-tailed)	,316	,081	,024	,065	,028	,364	,432	,376	,398	,029	,010	,000	.	,000	,235	,000	,011	,035	,411	,109	,133	,039	,363	,325	,139	,320	,127
		N	103	101	101	101	89	72	92	81	101	103	104	101	104	104	100	101	104	104	103	89	93	93	93	92	68	68	104
	Constraints: difficulties in monitoring companies	Correlation Coefficient	,124	-,144	-,151*	-,008	,147*	,172*	-,109	-,080	,064	,146*	,194**	,314**	,408**	1,000	,051	,332**	,112	,133*	,048	,014	-,004	,293**	,167*	,144*	-,120	-,019	-,068
		Sig. (1-tailed)	,062	,052	,044	,463	,041	,030	,101	,189	,234	,031	,007	,000	,000	.	,261	,000	,076	,046	,271	,437	,482	,000	,023	,044	,134	,429	,217
		N	104	102	102	102	89	72	92	81	102	104	104	102	104	105	101	102	105	105	104	89	93	94	93	92	69	69	105
	Constraints: problems in fundraising	Correlation Coefficient	,041	,177*	,114	-,104	,005	-,138	-,181*	-,119	-,027	,020	-,114	-,076	,058	,051	1,000	,120	,002	,187**	,212**	,173*	,139*	-,018	,145*	,168*	-,160	-,074	-,226**
		Sig. (1-tailed)	,307	,025	,103	,124	,475	,076	,018	,098	,380	,399	,080	,181	,235	,261	.	,069	,491	,010	,004	,022	,043	,418	,043	,025	,072	,249	,005
		N	101	99	99	99	87	69	89	79	99	100	100	98	100	101	102	101	101	101	101	88	90	91	91	90	66	66	102
	Constraints: high due diligence cost	Correlation Coefficient	,051	-,060	-,146	,079	,144*	-,043	,009	-,017	,025	,040	,031	,078	,349**	,332**	,120	1,000	,164*	,238**	,016	-,028	,014	,235**	,063	,180*	,161	,307**	-,060
		Sig. (1-tailed)	,268	,255	,055	,192	,048	,331	,457	,427	,391	,310	,353	,177	,000	,000	,069	.	,022	,002	,423	,375	,435	,003	,231	,019	,074	,003	,254
		N	102	100	100	100	88	70	91	81	100	101	101	90	101	102	101	103	102	102	102	88	91	92	91	90	68	68	103
	Constraints: geographical remoteness of company	Correlation Coefficient	,243**	,008	,151*	,049	,037	-,086	,027	-,027	,033	,067	,032	,043	,181*	,112	,002	,164*	1,000	,092	,208**	,041	,004	,084	,179*	,096	-,067	-,077	,015
		Sig. (1-tailed)	,001	,466	,044	,292	,332	,185	,378	,384	,356	,196	,343	,297	,011	,076	,491	,022	.	,123	,004	,315	,480	,164	,016	,130	,271	,240	,432
		N	104	102	102	102	89	72	92	81	102	104	104	102	104	105	101	102	105	105	104	89	93	94	93	92	69	69	105
	Constraints: shortage of staff with VC experience	Correlation Coefficient	,204**	-,053	,160*	,026	,143*	-,103	-,128	-,156*	-,137	,073	,026	-,048	,145*	,133*	,187**	,238**	,092	1,000	,116	,181*	,260**	,239**	,088	,113	-,018	-,198**	-,015
		Sig. (1-tailed)	,006	,278	,037	,385	,046	,141	,068	,045	,083	,179	,375	,279	,035	,046	,010	,002	,123	.	,071	,018	,001	,003	,147	,093	,434	,034	,431
		N	104	102	102	102	89	72	92	81	102	104	104	102	104	105	101	102	105	105	104	89	93	94	93	92	69	69	105
	Constraints: exit problems	Correlation Coefficient	,013	,039	,163*	-,148*	-,181*	-,004	-,181*	-,143	-,055	-,086	,041	-,011	,018	,048	,212**	,016	,208**	,116	1,000	,161*	,002	,063	,122	,177*	-,263**	-,006	-,165*
		Sig. (1-tailed)	,434	,330	,033	,047	,015	,482	,017	,057	,267	,137	,302	,447	,411	,271	,004	,423	,004	,071	.	,030	,490	,227	,073	,018	,007	,483	,029
		N	105	103	103	103	91	73	92	81	103	103	104	102	103	104	101	102	104	104	106	89	93	95	93	92	71	71	106
	Aspects: access to refinancing loans	Correlation Coefficient	,089	,031	,108	-,233**	-,049	-,151	-,101	-,242**	,071	-,006	-,091	-,114	-,106	,014	,173*	-,029	,041	,181*	,161*	1,000	,586**	,305**	,319**	,360**	-,100	-,181	,023
		Sig. (1-tailed)	,158	,374	,132	,008	,298	,071	,136	,006	,232	,471	,149	,095	,109	,437	,022	,375	,315	,018	,030	.	,000	,000	,000	,000	,192	,058	,405
		N	89	87	87	87	77	63	82	73	87	89	89	87	89	89	88	88	89	89	89	90	90	89	90	90	62	62	90
	Aspects: cheaper refinancing loans	Correlation Coefficient	,208**	-,059	,027	-,013	,226**	-,163*	-,107	-,164*	-,134	,005	-,038	-,002	,093	-,004	,139*	,014	,004	,260**	,002	,586**	1,000	,397**	,319**	,314**	,014	-,160	-,037
		Sig. (1-tailed)	,038	,264	,387	,447	,005	,050	,113	,040	,077	,474	,324	,491	,133	,482	,049	,435	,480	,001	,490	,000	.	,000	,000	,000	,450	,074	,343
		N	93	91	91	91	81	67	86	76	91	93	93	91	93	93	90	91	93	93	93	90	94	93	93	93	66	66	94
	Aspects: risk-mitigation (guarantees)	Correlation Coefficient	,229**	-,107	-,101	,072	,356**	,099	-,325**	-,367**	,034	,058	,075	,102	,152*	,293**	-,018	,235**	,084	,239**	,063	,305**	,397**	1,000	,347**	,275**	,098	-,138	-,085
		Sig. (1-tailed)	,004	,131	,144	,225	,000	,166	,000	,000	,362	,248	,192	,120	,039	,000	,418	,003	,164	,003	,227	,000	,000	.	,000	,001	,192	,110	,182
		N	95	93	93	93	82	67	85	76	93	94	94	93	93	94	91	92	94	94	95	89	93	96	93	92	68	68	96
	Aspects: public co-investment in companies	Correlation Coefficient	,214**	,174*	-,108	-,065	,018	-,048	-,139	-,162*	,029	,076	-,057	,025	,029	,167*	,145*	,063	,179*	,088	,122	,319**	,319**	,347**	1,000	,574**	-,105	-,137	-,110
		Sig. (1-tailed)	,007	,033	,127	,248	,421	,317	,060	,044	,381	,181	,251	,385	,363	,023	,043	,231	,016	,147	,073	,000	,000	,000	.	,000	,171	,108	,118
		N	93	91	91	91	81	66	85	75	91	93	93	91	93	93	91	91	93	93	93	90	93	93	94	93	66	66	94
	Aspects: public co-investment in fund	Correlation Coefficient	,154**	,121	-,065	-,157	-,131	-,116	-,089	-,135	,030	,005	-,084	-,067	,038	,144*	,168*	,180*	,096	,113	,177*	,360**	,314**	,275**	,574**	1,000	-,128	,071	-,105
		Sig. (1-tailed)	,039	,103	,248	,051	,074	,123	,162	,079	,375	,477	,165	,221	,325	,044	,025	,019	,130	,093	,018	,000	,000	,001	,000	.	,128	,263	,129
		N	92	90	90	90	80	66	85	75	90	92	92	90	92	92	90	90	92	92	92	90	93	92	93	93	65	65	93
	Reference to public finance: seed stage	Correlation Coefficient	-,279**	,039	-,130	,180	,025	,012	,352**	,325**	-,190	,070	,023	,049	,120	-,120	-,160	,161	-,067	-,018	-,263**	-,100	,014	,098	-,105	-,128	1,000	,243*	,150
		Sig. (1-tailed)	,006	,373	,139	,068	,414	,461	,001	,004	,058	,260	,417	,320	,139	,139	,072	,074	,271	,434	,007	,192	,450	,192	,171	,128	.	,021	,105
		N	70	71	71	70	63	53	63	56	69	69	69	68	68	69	66	68	69	69	71	62	66	68	66	65	71	71	71
	Reference to public finance: start-up stage	Correlation Coefficient	-,244*	,098	,013	-,021	-,150	-,108	,252*	,304**	,050	-,097	-,060	,051	,052	-,019	,074	,307**	-,077	-,198*	-,005	-,181	-,160	-,138	-,137	,071	,243*	1,000	,222*
		Sig. (1-tailed)	,014	,207	,456	,429	,093	,195	,014	,005	,338	,187	,292	,322	,320	,429	,249	,003	,240	,034	,483	,058	,074	,110	,108	,263	,021	.	,032
		N	70	71	71	70	63	53	63	56	69	69	69	69	68	69	66	68	69	69	71	62	66	68	66	65	71	71	71
	Involved with public VC in last 3 years?	Correlation Coefficient	-,148*	-,002	,110	,070	-,035	-,280**	,358**	,336**	,183*	,148*	,117	-,053	,101	-,068	-,226**	-,080	,015	-,015	-,165*	,023	-,037	-,085	-,110	-,106	,150	,222*	1,000
		Sig. (1-tailed)	,049	,494	,132	,240	,355	,004	,000	,000	,031	,046	,095	,279	,127	,217	,005	,254	,432	,431	,029	,405	,343	,182	,118	,129	,105	,032	.
		N	106	104	104	104	91	74	93	82	104	104	105	103	104	105	102	103	104	105	106	90	94	96	94	93	71	71	107

*. Correlation is significant at the .05 level (1-tailed).

**. Correlation is significant at the .01 level (1-tailed).

APPENDIX E

Correlations

		Does your co influence the management of the investee co?	Expected minimum rate of return	Realised rate of return in 2001	Failure rate in relation to volume of investment in 2001	Failure rate in relation to number of companies in 2001	Do you use a systematic rating instrument?	Aspects: risk-mitigation (guarantees)
Does your co influence the management of the investee co?	Pearson Correlation	1	,480**	,057	,079	,075	,049	,088
	Sig. (1-tailed)	.	,000	,317	,228	,255	,313	,201
	N	104	89	73	90	80	101	93
Expected minimum rate of return	Pearson Correlation	,480**	1	,208*	-,175	-,127	-,130	,401**
	Sig. (1-tailed)	,000	.	,041	,055	,138	,113	,000
	N	89	91	71	85	75	89	82
Realised rate of return in 2001	Pearson Correlation	,057	,208*	1	-,324**	-,176	-,067	,113
	Sig. (1-tailed)	,317	,041	.	,003	,083	,286	,181
	N	73	71	74	70	63	73	67
Failure rate in relation to volume of investment in 2001	Pearson Correlation	,079	-,175	-,324**	1	,871**	-,009	-,243*
	Sig. (1-tailed)	,228	,055	,003	.	,000	,467	,012
	N	90	85	70	93	80	90	85
Failure rate in relation to number of companies in 2001	Pearson Correlation	,075	-,127	-,176	,871**	1	-,024	-,328**
	Sig. (1-tailed)	,255	,138	,083	,000	.	,417	,002
	N	80	75	63	80	82	79	76
Do you use a systematic rating instrument?	Pearson Correlation	,049	-,130	-,067	-,009	-,024	1	,060
	Sig. (1-tailed)	,313	,113	,286	,467	,417	.	,284
	N	101	89	73	90	79	104	93
Aspects: risk-mitigation (guarantees)	Pearson Correlation	,088	,401**	,113	-,243*	-,328**	,060	1
	Sig. (1-tailed)	,201	,000	,181	,012	,002	,284	.
	N	93	82	67	85	76	93	96

**. Correlation is significant at the 0.01 level (1-tailed).

*. Correlation is significant at the 0.05 level (1-tailed).

Correlations

			Does your co influence the management of the investee co?	Expected minimum rate of return	Realised rate of return in 2001	Failure rate in relation to volume of investment in 2001	Failure rate in relation to number of companies in 2001	Do you use a systematic rating instrument?	Aspects: risk-mitigation (guarantees)
Kendall's tau_b	Does your co influence the management of the investee co?	Correlation Coefficie	1,000	,416**	-,024	,054	,041	,049	,072
		Sig. (1-tailed)	.	,000	,412	,290	,344	,312	,225
		N	104	89	73	90	80	101	93
	Expected minimum rate of return	Correlation Coefficie	,416**	1,000	,064	-,176*	-,139	-,107	,356**
		Sig. (1-tailed)	,000	.	,249	,024	,069	,130	,000
		N	89	91	71	85	75	89	82
	Realised rate of return i 2001	Correlation Coefficie	-,024	,064	1,000	-,304**	-,180*	-,006	,099
		Sig. (1-tailed)	,412	,249	.	,001	,039	,476	,166
		N	73	71	74	70	63	73	67
	Failure rate in relation t volume of investment ir 2001	Correlation Coefficie	,054	-,176*	-,304**	1,000	,817**	,008	-,325**
		Sig. (1-tailed)	,290	,024	,001	.	,000	,466	,000
		N	90	85	70	93	80	90	85
	Failure rate in relation t number of companies ir 2001	Correlation Coefficie	,041	-,139	-,180*	,817**	1,000	-,017	-,367**
		Sig. (1-tailed)	,344	,069	,039	,000	.	,436	,000
		N	80	75	63	80	82	79	76
	Do you use a systemati rating instrument?	Correlation Coefficie	,049	-,107	-,006	,008	-,017	1,000	,034
		Sig. (1-tailed)	,312	,130	,476	,466	,436	.	,362
		N	101	89	73	90	79	104	93
	Aspects: risk-mitigation (guarantees)	Correlation Coefficie	,072	,356**	,099	-,325**	-,367**	,034	1,000
		Sig. (1-tailed)	,225	,000	,166	,000	,000	,362	.
		N	93	82	67	85	76	93	96

**. Correlation is significant at the .01 level (1-tailed).

*. Correlation is significant at the .05 level (1-tailed).

APPENDIX F

Notation of variables for the partial correlation coefficients:

EXPRET = Expected minimum rate of return (question B12)
FAIL2 = Failure rate in relation to companies in 2001 (question B14)
INVPC31 = Investment allocation to business stage: seed (%) (question B11)
INVPC32 = Investment allocation to business stage: start-up (%)
PUB1 = Important Aspect: access to refinancing loans (question D5)
PUB2 = Important Aspect: access to cheaper refinancing loans
PUB3 = Important Aspect: risk mitigation (guarantees)
PUB4 = Important Aspect: public co-investment in companies
PUB5 = Important Aspect: public co-investment in fund

```
- - -  P A R T I A L   C O R R E L A T I O N   C O E F F I C I E N T S
- - -

Controlling for..    EXPRET

                FAIL2        PUB3

FAIL2          1,0000      -,2902
               (    0)     (   66)
               P= ,        P= ,008

PUB3           -,2902       1,0000
               (   66)     (    0)
               P= ,008     P= ,

(Coefficient / (D.F.) / 1-tailed Significance)

" , " is printed if a coefficient cannot be computed

-
- - -  P A R T I A L   C O R R E L A T I O N   C O E F F I C I E N T S
- - -
```

```
Controlling for..    INVPC31   INVPC32

               FAIL2       PUB3

FAIL2          1,0000      -,3850
              (    0)     (   71)
              P= ,        P= ,000

PUB3           -,3850      1,0000
              (   71)     (    0)
              P= ,000     P= ,

(Coefficient / (D.F.) / 1-tailed Significance)

" , " is printed if a coefficient cannot be computed
- - -  P A R T I A L   C O R R E L A T I O N   C O E F F I C I E N T S
- - -

Controlling for..    PUB1      PUB2      PUB4      PUB5

               FAIL2       PUB3

FAIL2          1,0000      -,2504
              (    0)     (   67)
              P= ,        P= ,019

PUB3           -,2504      1,0000
              (   67)     (    0)
              P= ,019     P= ,

(Coefficient / (D.F.) / 1-tailed Significance)

" , " is printed if a coefficient cannot be computed
-

- - -  P A R T I A L   C O R R E L A T I O N   C O E F F I C I E N T S
- - -

Controlling for..    PUB2
```

```
                FAIL2        PUB3

FAIL2          1,0000      -,2835
               (    0)     (   73)
               P= ,        P= ,007

PUB3           -,2835       1,0000
               (   73)     (    0)
               P= ,007     P= ,

(Coefficient / (D.F.) / 1-tailed Significance)

" , " is printed if a coefficient cannot be computed
```

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\- - - P A R T I A L C O R R E L A T I O N C O E F F I C I E N T S - - -

Controlling for.. PUB4

```
                FAIL2        PUB3

FAIL2          1,0000      -,2758
               (    0)     (   72)
               P= ,        P= ,009

PUB3           -,2758       1,0000
               (   72)     (    0)
               P= ,009     P= ,

(Coefficient / (D.F.) / 1-tailed Significance)

" , " is printed if a coefficient cannot be computed
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\- - - P A R T I A L C O R R E L A T I O N C O E F F I C I E N T S - - -

Controlling for.. PUB5

	FAIL2	PUB3
FAIL2	1,0000	-,2875
	(0)	(72)
	P= ,	P= ,006
PUB3	-,2875	1,0000
	(72)	(0)
	P= ,006	P= ,

(Coefficient / (D.F.) / 1-tailed Significance)

" , " is printed if a coefficient cannot be computed

APPENDIX G

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	Aspects: risk-mitigation (guarantees)[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: Failure rate in relation to number of companies in 2001

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,328[a]	,107	,095	1,286

a. Predictors: (Constant), Aspects: risk-mitigation (guarantees)

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14,708	1	14,708	8,892	,004[a]
	Residual	122,398	74	1,654		
	Total	137,105	75			

a. Predictors: (Constant), Aspects: risk-mitigation (guarantees)

b. Dependent Variable: Failure rate in relation to number of companies in 2001

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2,949	,251		11,736	,000
	Aspects: risk-mitigation (guarantees)	-,265	,089	-,328	-2,982	,004

a. Dependent Variable: Failure rate in relation to number of companies in 2001

APPENDIX H

Correlations

		Allocation to deal size class < £100th (%)	Allocation to deal size class £100-250th (%)	Allocation to business stages: seed (%)	Allocation to business stages: start-up (%)	Expected minimum rate of return	Realised rate of return in 2001	Failure rate in relation to volume of investment in 2001	Failure rate in relation to number of companies in 2001	Aspects: risk-mitigation (guarantees)	Aspects: public co-investment in companies	Aspects: public co-investment in fund	Share of public finance (%)	Constraints: exit problems
Allocation to deal size class < £100th (%)	Pearson Correlation	1	,242*	,434**	-,134	-,019	-,418**	,105	,035	-,254	-,235	-,518**	,423**	,218
	Sig. (1-tailed)	.	,042	,001	,173	,448	,009	,246	,414	,147	,159	,008	,005	,062
	N	52	52	52	52	51	32	45	40	19	20	21	37	51
Allocation to deal size class £100-250th (%)	Pearson Correlation	,242*	1	,349**	,283*	,095	-,380*	,085	-,133	-,027	-,143	-,235	,355*	-,370**
	Sig. (1-tailed)	,042	.	,006	,021	,253	,016	,288	,206	,457	,274	,152	,016	,004
	N	52	52	52	52	51	32	45	40	19	20	21	37	51
Allocation to business stages: seed (%)	Pearson Correlation	,434**	,349**	1	,009	,112	-,433**	-,206	-,228	,174	-,176	,105	,602**	,102
	Sig. (1-tailed)	,001	,006	.	,475	,209	,005	,080	,071	,231	,223	,322	,000	,231
	N	52	52	55	55	54	34	48	43	20	21	22	39	54
Allocation to business stages: start-up (%)	Pearson Correlation	-,134	,283*	,009	1	,210	-,393*	,002	,187	,218	,021	,037	-,092	-,074
	Sig. (1-tailed)	,173	,021	,475	.	,064	,011	,494	,115	,178	,464	,436	,289	,297
	N	52	52	55	55	54	34	48	43	20	21	22	39	54
Expected minimum rate of return	Pearson Correlation	-,019	,095	,112	,210	1	,142	-,237	-,186	,408*	,403*	,247	,018	-,054
	Sig. (1-tailed)	,448	,253	,209	,064	.	,211	,054	,120	,037	,035	,134	,457	,350
	N	51	51	54	54	55	34	47	42	20	21	22	39	54
Realised rate of return in 2001	Pearson Correlation	-,418**	-,380*	-,433**	-,393*	,142	1	-,121	-,155	,336	,163	,357	-,268	,043
	Sig. (1-tailed)	,009	,016	,005	,011	,211	.	,252	,211	,110	,273	,087	,084	,404
	N	32	32	34	34	34	34	33	29	15	16	16	28	34
Failure rate in relation to volume of investment in 2001	Pearson Correlation	,105	,085	-,206	,002	-,237	-,121	1	,852**	-,286	-,379*	-,628**	,006	-,209
	Sig. (1-tailed)	,246	,288	,080	,494	,054	,252	.	,000	,118	,049	,001	,487	,075
	N	45	45	48	48	47	33	49	43	19	20	21	38	49
Failure rate in relation to number of companies in 2001	Pearson Correlation	,035	-,133	-,228	,187	-,186	-,155	,852**	1	-,413	-,247	-,704**	-,022	,069
	Sig. (1-tailed)	,414	,206	,071	,115	,120	,211	,000	.	,056	,170	,001	,450	,328
	N	40	40	43	43	42	29	43	44	16	17	18	34	44
Aspects: risk-mitigation (guarantees)	Pearson Correlation	-,254	-,027	,174	,218	,408*	,336	-,286	-,413	1	,078	,568**	,037	-,076
	Sig. (1-tailed)	,147	,457	,231	,178	,037	,110	,118	,056	.	,369	,004	,436	,372
	N	19	19	20	20	20	15	19	16	21	21	21	21	21
Aspects: public co-investment in companies	Pearson Correlation	-,235	-,143	-,176	,021	,403*	,163	-,379*	-,247	,078	1	,697**	-,347	,029
	Sig. (1-tailed)	,159	,274	,223	,464	,035	,273	,049	,170	,369	.	,000	,057	,449
	N	20	20	21	21	21	16	20	17	21	22	22	22	22
Aspects: public co-investment in fund	Pearson Correlation	-,518**	-,235	,105	,037	,247	,357	-,628**	-,704**	,568**	,697**	1	-,258	,085
	Sig. (1-tailed)	,008	,152	,322	,436	,134	,087	,001	,001	,004	,000	.	,117	,350
	N	21	21	22	22	22	16	21	18	21	22	23	23	23
Share of public finance (%)	Pearson Correlation	,423**	,355*	,602**	-,092	,018	-,268	,006	-,022	,037	-,347	-,258	1	-,034
	Sig. (1-tailed)	,005	,016	,000	,289	,457	,084	,487	,450	,436	,057	,117	.	,417
	N	37	37	39	39	39	28	38	34	21	22	23	40	40
Constraints: exit problems	Pearson Correlation	,218	-,370**	,102	-,074	-,054	,043	-,209	,069	-,076	,029	,085	-,034	1
	Sig. (1-tailed)	,062	,004	,231	,297	,350	,404	,075	,328	,372	,449	,350	,417	.
	N	51	51	54	54	54	34	49	44	21	22	23	40	56

*. Correlation is significant at the 0.05 level (1-tailed).

**. Correlation is significant at the 0.01 level (1-tailed).

Correlations

			Allocation to deal size class < £100th (%)	Allocation to deal size class £100-250th (%)	Allocation to business stages: seed (%)	Allocation to business stages: start-up (%)	Expected minimum rate of return	Realised rate of return in 2001	Failure rate in relation to volume of investment in 2001	Failure rate in relation to number of companies in 2001	Aspects: risk-mitigation (guarantees)	Aspects: public co-investment in companies	Aspects: public co-investment in fund	Share of public finance (%)	Constraints: exit problems	Frequent involvment: University challenge fund	Involved with public VC in last 3 years?
Kendall's tau_b	Allocation to deal size class < £100th (%)	Correlation Coefficien	1,000	,414**	,361**	,107	,096	-,293*	,051	,004	-,131	-,138	-,344*	,412**	,081	,212	,361**
		Sig. (1-tailed)	.	,000	,001	,174	,223	,026	,349	,488	,258	,241	,034	,002	,246	,109	,003
		N	52	52	52	52	51	32	45	40	19	20	21	37	51	29	52
	Allocation to deal size class £100-250th (%)	Correlation Coefficien	,414**	1,000	,454**	,240*	,074	-,278*	,111	-,127	-,098	-,008	-,277	,283*	-,321**	,049	,373**
		Sig. (1-tailed)	,000	.	,000	,017	,275	,031	,193	,179	,312	,484	,066	,020	,003	,386	,002
		N	52	52	52	52	51	32	45	40	19	20	21	37	51	29	52
	Allocation to business stages: seed (%)	Correlation Coefficien	,361**	,454**	1,000	,291**	,097	-,377**	-,092	-,154	,135	-,210	,080	,368**	-,105	,321*	,571**
		Sig. (1-tailed)	,001	,000	.	,004	,211	,004	,229	,119	,241	,132	,328	,003	,175	,024	,000
		N	52	52	55	55	54	34	48	43	20	21	22	39	54	30	55
	Allocation to business stages: start-up (%)	Correlation Coefficien	,107	,240*	,291**	1,000	,161	-,327**	,054	,116	,166	,111	,006	,075	-,066	,304*	,239*
		Sig. (1-tailed)	,174	,017	,004	.	,078	,009	,323	,174	,193	,276	,487	,278	,267	,029	,024
		N	52	52	55	55	54	34	48	43	20	21	22	39	54	30	55
	Expected minimum rate of return	Correlation Coefficien	,096	,074	,097	,161	1,000	,083	-,284*	-,257*	,335	,412*	,283	,020	-,077	,205	,139
		Sig. (1-tailed)	,223	,275	,211	,078	.	,285	,013	,030	,059	,024	,078	,444	,253	,129	,141
		N	51	51	54	54	55	34	47	42	20	21	22	39	54	30	55
	Realised rate of return in 2001	Correlation Coefficien	-,293*	-,278*	-,377**	-,327**	,083	1,000	-,141	-,173	,226	,202	,317	-,172	,015	-,373*	-,310*
		Sig. (1-tailed)	,026	,031	,004	,009	,285	.	,166	,134	,162	,181	,073	,134	,457	,035	,022
		N	32	32	34	34	34	34	33	29	15	16	16	28	34	20	34
	Failure rate in relation to volume of investment in 2001	Correlation Coefficien	,051	,111	-,092	,054	-,284*	-,141	1,000	,828**	-,173	-,256	-,460**	,117	-,146	-,364*	,107
		Sig. (1-tailed)	,349	,193	,229	,323	,013	,166	.	,000	,206	,104	,009	,200	,109	,022	,211
		N	45	45	48	48	47	33	49	43	19	20	21	38	49	27	49
	Failure rate in relation to number of companies in 2001	Correlation Coefficien	,004	-,127	-,154	,116	-,257*	-,173	,828**	1,000	-,097	-,043	-,454*	,077	,101	-,317*	,120
		Sig. (1-tailed)	,488	,179	,119	,174	,030	,134	,000	.	,344	,427	,018	,299	,211	,046	,197
		N	40	40	43	43	42	29	43	44	16	17	18	34	44	25	44
	Aspects: risk-mitigation (guarantees)	Correlation Coefficien	-,131	-,098	,135	,166	,335	,226	-,173	-,097	1,000	,279	,608**	-,079	-,015	,215	-,143
		Sig. (1-tailed)	,258	,312	,241	,193	,059	,162	,206	,344	.	,085	,001	,335	,469	,173	,250
		N	19	19	20	20	20	15	19	16	21	21	21	21	21	18	21
	Aspects: public co-investment in companies	Correlation Coefficien	-,138	-,008	-,210	,111	,412*	,202	-,256	-,043	,279	1,000	,676**	-,379*	,095	-,099	-,143
		Sig. (1-tailed)	,241	,484	,132	,276	,024	,181	,104	,427	,085	.	,000	,018	,305	,328	,246
		N	20	20	21	21	21	16	20	17	21	22	22	22	22	19	22
	Aspects: public co-investment in fund	Correlation Coefficien	-,344*	-,277	,080	,006	,283	,317	-,460**	-,454*	,608**	,676**	1,000	-,329*	,117	,121	-,307
		Sig. (1-tailed)	,034	,066	,328	,487	,078	,073	,009	,018	,001	,000	.	,030	,256	,284	,061
		N	21	21	22	22	22	16	21	18	21	22	23	23	23	20	23
	Share of public finance (%)	Correlation Coefficien	,412**	,283*	,368**	,075	,020	-,172	,117	,077	-,079	-,379*	-,329*	1,000	-,023	,095	,517**
		Sig. (1-tailed)	,002	,020	,003	,278	,444	,134	,200	,299	,335	,018	,030	.	,429	,297	,000
		N	37	37	39	39	39	28	38	34	21	22	23	40	40	25	40
	Constraints: exit problems	Correlation Coefficien	,081	-,321**	-,105	-,066	-,077	,015	-,146	,101	-,015	,095	,117	-,023	1,000	-,036	-,003
		Sig. (1-tailed)	,246	,003	,175	,267	,253	,457	,109	,211	,469	,305	,256	,429	.	,413	,490
		N	51	51	54	54	54	34	49	44	21	22	23	40	56	31	56
	Frequent involvment: University challenge fund	Correlation Coefficien	,212	,049	,321*	,304*	,205	-,373*	-,364*	-,317*	,215	-,099	,121	,095	-,036	1,000	-,015
		Sig. (1-tailed)	,109	,386	,024	,029	,129	,035	,022	,046	,173	,328	,284	,297	,413	.	,468
		N	29	29	30	30	30	20	27	25	18	19	20	25	31	31	31
	Involved with public VC in last 3 years?	Correlation Coefficien	,361**	,373**	,571**	,239*	,139	-,310*	,107	,120	-,143	-,143	-,307	,517**	-,003	-,015	1,000
		Sig. (1-tailed)	,003	,002	,000	,024	,141	,022	,211	,197	,250	,246	,061	,000	,490	,468	.
		N	52	52	55	55	55	34	49	44	21	22	23	40	56	31	57

**. Correlation is significant at the .01 level (1-tailed).

*. Correlation is significant at the .05 level (1-tailed).

BIBLIOGRAPHY

Abel, A. and Blanchard, O. (1986), The Present Value of Profits and the Cyclical Movement of Investment, Econometrica, 54, 2 (March), 249-73

Adelberger, K.E. (2000), Semi-Sovereign Leadership? The State's Role in German Biotechnology and Venture Capital Growth, German Politics, 9, 1 (April), 103-122

Aernoudt, R. (1999), European Policy towards Venture Capital: Myth or Reality? Venture Capital, 1, 1 (January-March), 47-58

Allan, F. (1993), Stock Markets and Resource Allocation, in Mayer, C. and Vives, X. (Eds), Capital Markets and Financial Intermediation, Cambridge: Cambridge University Press, 81-108

Allan, F. and Gale, D. (1994), Limited Market Participation and Volatility of Asset Prices, American Economic Review, 84, 4 (September), 933-5

- (1995), A Welfare Comparison of Intermediaries and Financial Markets in Germany and the US, European Economic Review 39, 2 (February), 179-209

- (1997), Financial Markets, Intermediaries, and Intertemporal Smoothing, Journal of Political Economy, 105, 3 (June), 523-546

- (1999), Diversity of Opinion and the Financing of New Technology, Journal of Financial Intermediation, 8, 1-2 (January-April), 68-89

- (2000), Comparing Financial Systems, Cambridge MA/London: MIT Press

Allan, F. and Santomero, A.M. (2001), What Do Financial Intermediaries Do? Journal of Banking and Finance, 25, 271-294

Arestis, P. and Demetriades, P. (1997), Financial Development and Economic Growth: Assessing the Evidence, Economic Journal, 107, 442, 783-800

Arestis, P. and Karakitsos, E. (2003a), The Conditions for Sustainable U.S. Recovery: The Role of Investment, The Levy Economics Institute, Working Paper No. 378

- (2003b), How Long Can the U.S. Consumers Carry the Economy on Their Shoulders? The Levy Economics Institute, Working Paper No. 380

Bagehot, W. (1873), Lombard Street, A Description of the Money Market, London

Bank of England (2001), Financing of Technology-based Small Firms, London: Bank of England

Bannock Consulting (2001), Final Report: Innovative Instruments for Raising Equity for SMEs in Europe, Prepared for DG Enterprise of the European Commission, Brussels Luxembourg: ECSE-EC-EAEC

Barran, F., Coudert, V., Mojon, B. (1996), The Transmission of Monetary Policy in the European Countries, in: Collignon, S. (Ed), European Monetary Policy, London and Washington D.C.: Pinter, 81-111

Bascha, A. and Walz, U. (2001). Financing Practices in the German Venture Capital Industry: An Empirical Assessment, Tübingen

Becker, R. and Hellmann, T. (2003), The Genesis of Venture Capital. Lessons from the German Experience, in: Keuschnigg, C. and Kanniainen, V. (Ed) (2003), Venture Capital, Entrepreneurship, and Public Policy, MIT Press

Bencivenga, V.R. and Smith, B.D., (1991), Financial Intermediation and Endogenous Growth, Review of Economic Studies 58, 2 (April), 195-209

Bernanke, G. (1990), Financial Fragility and Economic Performance, Quarterly Journal of Economics, 105, 1 (February), 87-114

Bernanke, B.S. and Blinder, A. S. (1988), Credit, Money, and Aggregate Demand, American Economic Review, 78, 2 (May), 435-439

Bernanke, B.S. and Gertler, M. (1995), Inside the Black Box: The Credit Channel of Monetary Policy Transmission, Journal of Economic Perspectives, 9, 4 (Fall), 27-48

- (89), Agency Costs, Net Worth, and Business Fluctuations, American Economic Review, 79, March, 14-31

Bernanke, B.S., Gertler, M., Gilchrist, S. (1996), The Financial Accelerator and the Flight to Quality, Review of Economics and Statistcs, 78, 1 (February), 1-15

Bernanke, B.S. and Gilchrist, S. (1996), The Financial Accelerator and the Flight to Quality, Review of Economics and Statistics, volume 87, 1-15

Betz, K. (1993), Ein monetärkeynesianisches makroökonomisches Gleichgewicht, Marburg: Metropolis Verlag

- (1997), Drei Partial-Modelle des kurzfristigen Gleichgewichts mit endogenem Geld, Diskussionsbeträge des Fachbereichs Wirtschaftswissenschaften der Freien Universität Berlin Nr. 1997/6, Volkswirtschaftliche Reihe

BIS (1995), Financial Structure and the Monetary Policy Transmissions Mechanism, CB 394, Basle

Black, B. and Gibson, R. (1998) Venture Capital and the Structure of Capital Markets: Banks versus Stock Markets, Journal of Financial Economics, 47, 243-277

Black, S. and Moersch, M. (1998), Financial Structure, Investment and Growth, in: Black, S. and Moersch, M. (Eds), Competition and Convergence in Financial Markets. The German and Anglo-American Models, Elsevier: North Holland

Blinder A. and Stiglitz, J. (1983), Money, Credit Constraints and Economic Activity, American Economic Review, 73, 2 (May), 297-302

Bockelmann, H. (1996), Unterschiede in den nationalen Finanzstrukturen und ihre makroökonomische Bedeutung, in: Duwendag, D. (Ed): Finanzmärkte, Finanzinnovationen und Geldpolitik, Schriften des Vereins für Socialpolitik, Neue Folge, Bd. 242, Berlin

Borio, C.V.E. (1995), The Structure of Credit to the Non-Government Sector and the Transmission Mechanism of Monetary Policy: A Cross-Country Comparison, BIS Working Paper, April 1995

Borio, C.E.V. and Fritz, W. (1995), The Response of Short-Term Bank Lending Rates to Policy Rates: A Cross-Country Perspective, BIS Working Paper, May 1995

Brainhard, W.C. and Tobin, J. (1968), Pitfalls in Financial Model Building, American Economic Review, Papers and Proceedings, 58, 2 (May), 99-122, reprinted in: Tobin (1971), 352-377

- (1977), Asset Markets and the Cost of Capital, in: Nelson, R. and Balassa, B. (Eds), Economic Progress, Private Values and Public Policy: Essays in Honor of William Fellner, Amsterdam, 235-262, reprinted in: Tobin (1982), 46-73

Brealey, R.A. and Myers, S.C. (1991), Principles of Corporate Finance, New York

British Venture Capital Association (2002), Report on Investment Activity, 2001, London: BVCA

Bryma, A. and Cramer, D. (2001), Quantitative Data Analysis with SPSS Release 10 for Windows, A Guide for Social Scientist, Routledge: Hove and New York (Reprint 2002)

Brunner, K. and Meltzer, A.H (1972), Money, Debt, and Economic Activity, Journal of Political Economy, 80 (September/October), 951-77

Bundesrechungshof (2002), Jahresbericht 2002, http://www.Bundesrechungshof.de

BVK, Bundesverband deutscher Kapitalbeteiligungsgesellschaften, Jahresberichte, www.bvk-eb.de

Capie, F. and Collins, M. (1992), Have the Banks failed British Industry?, IEA Hobart Paper, No 119

Caprio, G. and Demirgürg-Kunt, A. (1997), The Role of Long-Term Finance: Theory and Evidence, Working Paper No. 1746, The World Bank, Washington, D.C.

Carpenter, R.E. and Petersen, B. (2002), Is the Growth of Small Firms constrained by Internal Finance? Review of Economics and Statistics, 84, 2 (May), 298-309

Chami, R., Cosimano, T.F., Fullenkamp, C. (1999), The Stock Market Channel of Monetary Policy, IMF Working Paper WP/99/22

Chick, V. (1973), Theory of Monetary Policy, London: Gray-Mills Publishing

- (1995), Finance and Investment in the Context of Development: A Post Keynesian Perspective, DP 95-13, University College London, Department of Economics

Chick, V. and Dow, S. (1994), Competition and the Future of the European Banking and Financial System, Department of Economics, University College London, Discussion Paper 94-16, also published in: Cohen, A., Hagemann, H., Smithin, J. (Eds), Money, Financial Institutions and Macroeconomics, Boston, Dordrecht and London: Kluwer Academic, 253-70

Chirinko, R.S. (1993), Business Fixed Investment Spending: Modelling Strategies, Empirical Results, and Policy Implications, Journal of Economic Literature, 31, 4, 1875-1911

- (1997), Finance Constraints, Liquidity, and Investment Spending: Theoretical Restrictions and International Evidence, Journal of The Japanese and International Economies, 11, 185-207

Cobham, D. (Ed) (1992), Markets and Dealers: The Economics of the London Financial Markets, Longman

Cohen, A, Hagemann, H., Smithin, J. (Eds) (1997), Money, Financial Institutions and Macroeconomics, Recent Economic Thought Series, Boston, Dordrecht and London: Kluwer Academic

Colin, S., Sattar, D., Fisher, T., Mayo, E., Mullineux, A. (2001), The Performance and Transformation of Soft-Loan Funds in the UK, Research funded by the Joseph Rowntree Foundation, London: New Economics Foundation

Coopey, R. and Clarke, D. (1995), 3I: Fifty Years Investing in Industry, Oxford: Oxford University Press

Cowie, H. (1999), Venture Capital in Europe, London: The Federal Trust

Cressy, R. (2002), Funding Gaps: A Symposium, The Economic Journal, 112, 477 (February), F1-F16

Cruikshank, D. (2000), Competition in UK Banking. A Report to the Chancellor of the Exchequer, The Stationary Office, London

Cobham, D. P. (Ed) (1992), Markets and Dealers. The Economics of the London Financial Markets. London/New York 1992

Cooper & Lybrand (1993), Final Report for the Study on International Differences in the Cost of Capital for the European Community

Corbett, J. and Jenkinson, T. (1996), The Financing of Industry, 1970-1989: An International Comparison, Journal of the Japanese and International Economics, volume 10, 71-96

- (1997), How is Investment financed? A Study of Germany, Japan, The United Kingdom and the United States, The Manchester School Supplement 1997, volume LXV, 69-93

Cottrell, A. (1994), Post Keynesian Monetary Economics. A Critical Survey, Cambridge Journal of Economics, 18, 587-605

Cowie, H. (1999), Venture Capital in Europe, London: The Federal Trust

D'Auria, C., Foglia, A., Reetz, P.M. (1999), Bank Interest Rates and Credit Relationships in Italy, Journal of Banking and Finance 23, 7 (July), 1067-1093

Davis E.P. (1995 2ed), Debt, Financial Fragility, and Systemic Risk, Oxford: Oxford University Press

de Bondt, G. (1999), Credit Channels and Consumption in Europe: Empirical Evidence, BIS Working Paper No.69, June

- (2000), Financial Structure and Monetary Transmission in Europe: A Cross Country Study, Aldershot and Lyme: Edward Elgar

Diamond, D.W. and Dybvig, P.H. (1983), Bank Runs, Deposit Insurance and Liquidity, Journal of Political Economy, 91, 3 (June), 401-19

Deleplace, G. and Nell, E.J. (1996a), Monetary Circulation and Effective Demand, in Deleplace, G. and Nell, E.J. (Eds) (1996b), 3-41

- (Eds) (1996b), Money in Motion. The Post Keynesian and Circulation Approach, Jerome Levy Institute, New York and London: St. Martin's Press and Macmillan Press

de Meza, D. (2002), Overlending, Economic Journal, 112, 477 (February), F17-F31

Devereux, M. and Schiantarelli, F. (1990), Investment, Financial Factors, and Cash-Flow: Evidence from UK Panel Data, in Hubbard 1990, 279-306

Dewatripont, M. and Maskin, E. (1990), Contract Renegotiation in Models of Asymmetric Information, European Economic Review, 34, 2-3, 311-321

- (1995), Credit and Efficiency in Centralized and Decentralized Economies, Review of Economic Studies, 62, 541-555

de Witte, N. (1999), Netherlands – EBAN Report, NEBIB

Dohse, D. (2001), Deutsche Technologiepolitik auf neuen Pfaden. Einige Anmerkungen zur regionenorientierten Innovationspolitik der Bundesregierung, Raumforschung und Raumordnung 59, 5-6, 446-455

Doran, A. and Bannock, G. (2000), Publicly Sponsored Regional Venture Capital: What Can the UK Learn from the US Experience? Venture Capital 2, 4, 255-285

Dornbush, R., Favero, C., Giavazzi, F. (1998), Immediate Challenges for the European Central Bank, European Policy, 13, 26 (April), 15-64

Dow, S.C. (1986), Speculation and the Monetary Circuit with Particular Attention to the Euro-Currency Market, Economies et Societes, 20, 8-9 (August-September), 95-110

- (1997), Endogenous Money, in: Harcourt, G.C., Riach, P.A., Riach, R.A. (Eds), A 'Second Edition' of the General Theory, volume 2, London: Routledge, 61-78

Dow, S.C. and Rodriguez-Fuentes, C.J. (1991), Regional Finance: A Survey, Regional Studies, 31, 9, 903-920

DTI (1998), Our Competitive Future: Building the Knowledge Economy, London: TSO

- (1999), Addressing the SME Equity Gap: Support for Regional Venture Capital Funds, Consultation Document on Support for Regional Venture Capital Funds, SME Policy Directorate, July 1999, URN 99/876

- (2002), Business Start-ups and Closures: VAT Registrations and De-Registrations 1994 – 2001, http:www.sbs.gov.uk

Edwards, F.R. (1993), Financial Markets in Transition. Or the Decline of Commercial Banking, in: Changing Capital Markets: Implications for Monetary Policy, Federal Reserve Bank of Kansas City, 5-62

Edwards, J. and Fischer, K. (1994), Banks, Finance and Investment in West Germany since 1970, Cambridge: Cambridge University Press

Elston, J.A. (1998), Investment, Liquidity Constraints and Bank Relationships: Evidence from German Manufacturing Firms, in Black/Moersch 1998

European Commission (1998), Risk Capital: A Key to Job Creation in the European Union, Brussels: European Commission

- (1999), Risk Capital: Implementation of the Action Plan: Proposals for Moving Forward, Brussels: European Commission

- (2001a), State Aid and Risk Capital, Official Journal of the European Communities, C 235/3, 21.8.2001

- (2001b), On Implementation of the Risk Capital Action Plan (RCAP), Communication from the Commission to the Council and the European Parliament, 605 final, 25.10.2001

European Venture Capital Association (2002), Annual Survey (http//www.eva.com)

Evans, D. and Jovanovic, B. (1989), An Estimated Model of Entrepreneural Choice under Liquidity Constraints, Journal of Political Economy, 97, 4, 808-827

Ewert, R. and Schenk, G. (1998), Determinants of Bank Lending Performance, CFS Working Paper No. 98/06, Frankfurt a.M.: Center for Financial Studies

Fazzari, S., Hubbard, G., Peterson, B., (1988), Financing Constraints and Corporate Investment, Brooking Papers on Economic Activity, 1, 141-195

Fiedler, M.O. and Hellmann, T. (2001), Against All Odds. The Late but Rapid Development of the German Venture Capital Industry, in: The Journal of Private Equity, Fall 2001, 31-45

Fier, A. and Harhoff, M. (2001), Die Evolution der bundesdeutschen Forschungs- und Technologiepolitik: Rückblick und Bestandsaufnahme, ZEW Discussion Paper No. 01-61, Zentrum für Europäische Wirtschaftsforschung, Mannheim

Florida, R. and Kenney, M. (1988), Venture Capital, High Technology and Regional Development, Regional Studies 22, 1, 33-48

Fountas, S. and Papagapitos, A. (2001), The Monetary Transmission Mechanism: Evidence and Implications for Monetary Union, Economic Letters, 70, 397-404

Frowen, S.F. and Karakitsos, E. (1996), Monetary Policy in the UK and Germany under Conditions of Globalised Money and Capital Markets. Lessons for the Personal Sector, Public Finance 51, 3, 305-24

Frowen, S.F. and Kath, D. (1992), Monetary Policy and Financial Innovations in Five Industrial Countries: The Uk, the Usa, West Germany, France and Japan, Basingstoke and New York: Palgrave/McMillan

Frowen, S.F. and McHugh, F.P. (Eds) (2001), Financial Competition, Risk and Accountability: British and German Experience, in Association with the Anglo-German Foundation for the Study of Industrial Society, Basingstoke and New York: Palgrave

Gardner, E.P.M. and Molyneux, P. (1993), Changes in Western European Banking - An International Bankers Guide, London: Routledge

Gambacorta, L. (2003), Asymmetric Bank Lending Channels and ECB Monetary Policy, Economic Modelling, 20, 1 (January), 25-46

Gatti, D.D., Gallegati, M., Minsky, H.P. (1996), Financial Institutions, Economic Policy, and the Dynamic Behavior of the Economy, in: Helmstädter, E. and Perlman, M. (Eds), Behavioral Norms, Technological Progress, and Economic Dynamics, Studies in Schumpeterian Economics, Ann Arbor: University of Michigan Press, 393-411

Gertler, M. (1988), Financial Structure and Aggregate Economic Activity: An Overview, Journal of Money, Credit and Banking, 20, 3, part 2 (August), 559-88

Gerschenkron, A. (1962), Economic Backwardness in Historical Perspective: A Book of Essays, Cambridge/MA: Harvard University Press

- (1968), Continuity in History and Other Essays, Cambridge/MA: Harvard University Press

Gill, D., Martin, C., Minshall, T., Rigby, M. (2000), Funding Technology: Lessons from America, London: Wardour Publications

Goodhart, C.A.E. (1987), Why Do Banks Need a Central Bank? Oxford Economic Papers N.S. 39 1987, 75-89

Goodley, W. (1999), Money and Credit in a Keynesian Model of Income Determination, Cambridge Journal of Economics, 23, 2 (April), 393-411

Greenwald, B.C., Levinson, A., Stiglitz, J.E. (1993), Capital Market Imperfections and Regional Development, in: Giovanni, Alberto (Ed), Finance and Development: Issues and Experience, Cambridge University Press

Greenwald, B. and Stiglitz, J.E. (1984), Informational Imperfections in the Capital Market and Macroeconomic Fluctuations, American Economic Review, 74, 2 May, 194-199

- (1986), Externalities in Economics with Imperfect Information and Incomplete Markets, Quarterly Journal of Economics, 101 (May)

- (1990), Macroeconomic Models with Equity and Credit Rationing, in: Hubbard, R.G. (Ed), 15-42

- (1993), Financial Market Imperfections and Business Cycles, Quarterly Journal of Economics, 108, February, 77-114

Guender, A. and Moersch, M. (1997), On the Existence of a Credit Channel of Monetary Policy in Germany, Kredit und Kapital, 30, 2, 173-185

Gurley, J.G. and Shaw, E.S. (1960), Money in the Theory of Finance, Brooking Institution, Washington D.C.

Hackethal, A. and Schmidt, R.H. (1999), Financing Patterns: Measurement Concepts and Empirical Results, Discussion Paper No. 33, Working Paper Series: Finance and Accounting, University of Frankfurt

Hannemann, G. and Schmeisser, W. (2001), Möglichkeiten der Fördermittel-Kombination bei Existenzgründungen: Kombinationslogik'. In: Schmeisser, W. and Krimphove, D. (Eds), Vom Gründungsmanagement zum Neuen Markt: Strategien für technologieorientierte kleine und mittlere Unternehmen. Wiesbaden: Gabler, 135–49

Harcourt, G.C. and Riach, R.A. (Eds) (1997), A 'Second Edition' of the General Theory, volume 1 & 2, London: Routledge

Harding, R. (1999), Venture Capital and Regional Development, London: IPPR

Harding, R. and Paterson, W. (Eds) (2000), The Future of the German Economy: An End to the Miracle? Manchester: MUP

Harrison, R.T. and Mason, C.M. (2000a), Editorial: The Role of the Public Sector in the Development of a Regional Venture Capital Industry, Venture Capital, 2, 4 (October-December), Special Issue: Public Sector Venture Capital and Regional Development, 243-53

- (2000b), Venture Capital Market Complementaries: The Links between Business Angels and Venture Capital Funds in the United Kingdom, Venture Capital, 2, 3 (July-September), 223-242

Hartung, J. (1999), Lehr- und Handbuch der angewandten Statistik (12th Ed), Oldenbourg: München

Heering, W. (1991), Geld, Liquiditätsprämie und Kapitalgüternachfrage: Studien zur entscheidungstheoretischen Fundierung einer mönetären Theorie der Produktion, Regensburg: Transfer-Verlag

Herten, S. and Hölscher, J. (2000), "Anglo-Saxon" or "Rhenish" Financial Markets for Central-East Europe?, in Hölscher, J. (Ed), Financial Turbulences and Capital

Markets in Transition Economies, London: McMillan, New York: St. Martin's Press, 13-24

- (2001), Capital and Credit based Development - Lessons from the Experience of Industrial Countries for Transition Economies in Central East Europe, in: Frowen/McHugh (2001), 225-250

Hewitson, G. (1995), Postkeynesian Monetary Theory: Some Issues, Journal of Economic Surveys, 9, 3 September, 285-310

Hicks, J.R. (1989), A Market Theory of Money, Oxford, New York, Toronto and Melbourne: Oxford University Press and Clarendon Press

Hirshleifer, J. and Riley, J.G. (1992), The Analytics of Uncertainty and Information, Cambridge: Cambridge University Press

HM Treasury (2001), The Myners Review of Institutional Investment in the United Kingdom: Report March 2001, www.hm-treasury.gov.uk

- (2003), Housing, Consumption and EMU, in: UK Membership of the Single Currency: An Assessment of the Five Economic Tests, www.hm-treasury.gov.uk

HM Treasury and DTI (2001), Productivity in the UK: Part 3 The Regional Dimension

Hubbard, R.G. (Ed) (1990), Asymmetric Information, Corporate Finance, and Investment, NBER, Chicago and London: University of Chicago Press

- (1998), Capital-Market Imperfections and Investment, Journal of Economic Literature, 36, 1 (March), 193-225

Hölscher, J. (1994), Entwicklungsmodell Westdeutschland. Aspekte der Akkumulation in der Geldwirtschaft, Berlin: Duncker & Humblot

Holstrom, B. and Tirole, J. (1997), Financial Intermediation, Loanable Funds, and the Real Sector, Quarterly Journal of Economics, CXII, 3 (August), 663-686

Hood, N. (2000), Public Venture Capital and Economic Development: The Scottish Experience, Venture Capital 2, 4, 313-341

Horn, E-J. (1994), Neuere Entwicklungen auf dem deutschen Kapitalmarkt. Institutionen, Marktstrukturen und Marktergebnisse, Tübingen: Mohr

Howells, P.G.A. (1999), The Source of Endogenous Money, Economic Issues, 4, 1 (March), 101-112

Jaffee, D.M. and Russell, T (1976), Imperfect Information, Uncertainty and Credit Rationing, Quarterly Journal of Economics, 90, 4 November, 651-666

Jensen, M.C. and Meckling, W.H. (1976), Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure, Journal of Financial Economics, 3, 4, October, 305-360

Kaplan, S.N. and Zingales, L. (2000), Investment – Cash Flow Sensitivities are not Valid Measures for Financing Constraints, Quarterly Journal of Economics, 115, 2 (May), 707-712

Kashyap, A.K. (1997), The Lending Channel and European Monetary Union, in Collignon, S. (Ed), European Monetary Policy, London: Pinter, 42-71

Keuschnigg, C. and Nielsen, S.B. (2001), Public Policy for Venture Capital, International Tax and Public Finance, 8, 4 (August), 557-572

Keynes, J. M. (1930), A Treatise on Money, London: Macmillan

- 1933 (1977), A Monetary Theory of Production, in Volume 13 of the Collected Writings of John Maynard Keynes

- (1936), The General Theory of Employment, Interest, and Money, London: Macmillan

KfW (2003), Beteiligungskapital in Deutschland: Anbieterstrukturen, Verhaltensmuster, Marktlücken, und Förderbedarf. Fortschreitende Professionalisierungstendenzen in einem noch jungen Markt, Mai 2003, Berlin: KfW Bankengruppe, www.kfw.de/DE/Research/Sonderthem68/Beteiligun15/Beteiligungsmarkt_Strukur .pdf

King, R.G. and Levine, R. (1993), Finance and Growth: Schumpeter Might Be Right, Quarterly Journal of Economics, 108, 3 August, 717-737

Kulicke, M. (1997a), Förderung junger Technologieunternehmen in Deutschland, in: Koschatzky, K. (Ed), Technologieunternehmen im Innovationsprozeß, Heidelberg: Physika, 127-152

- (1997b), Die Finanzierung technologieorientierter Unternehmensgründungen, in: Koschatzky, K. (Ed), Technologieunternehmen im Innovationsprozeß, Heidelberg: Physika, 127-152

Kulicke, M. and Wupperfeld, U. (1996), Beteiligungskapital für junge Technologieunternehmen. Ergebnisse eines Modellversuchs, Heidelberg: Physica

Laughlin, J.D and Digirolamo, V.A. (1994) A Market-Based Approach to Development Finance: A Case Study of the Capital Access Program, Economic Development Quarterly, 316, 216-229

Lavoie, M. (2001), Endogenous Money in a Coherent Stock-Flow Framework, Conference paper: Monetary Foundations of Macroeconomic Policy. Old Puzzles and New Issues, Free University of Berlin, March 23-25

Lavoie, M. and Goodley, W. (2002), Kaleckian Models of Growth in a Coherent Stock-Flow Monetary Framework. A Kaldorian View, Journal of Post Keynesian Economics, 24, 2 (Winter 2001-2), 277-311

Leadbeater, C. (2000), Europe's New Economy, London: Centre for European Reform

Lerner, J. (1999), The Government as Venture Capitalist: The Long Run Impact of the SBIR Program, Journal of Business, 72, 3 (July), 285- 318

- (2002), When Bureaucrats meet Entrepreneurs: The Design of Effective 'Public Venture Capital' Programmes, Economic Journal, 112, 447 (February), F73-F84

Link, A.N. and Scott, J.T. (2001), Public/Private Partnerships: Stimulating Competition in a Dynamic Market, International Journal of Industrial Organization, 19, 5 (April), 763-94

Lonsdale, C. (1997), The UK Equity Gap. The Failure of Government Policy since 1945, Aldershot: Ashgate Publishing

McGlue, D. (2002), The Funding of Venture Capital in Europe: Issues for Public Policy, Venture Capital 4, 1, 45-58

Macmillan Report (1931), Committee on Finance and Industry, London: HMSO

Mankiw, N.G. and Zeldes, S.P. (1990), The Consumption of Stockholders and Non-Stockholders, Journal of Financial Economics, 29, 1 (March), 97-112

Martin, R.L. (1989) The Growth and Geographical Anatomy of Venture Capitalism in the UK, Regional Studies, 23, 5, 389-403.

Martin, R.L., Herten, S., Sunley, P., Klagge, B., Berndt, C. (2003), Regional Venture Capital Policy: UK and Germany Compared, London: Anglo-German Foundation, www.agf.org.uk

Mason, C.M. and Harrison, R.T. (1991), Venture Capital, the Equity Gap and the 'North-South-Divide' in the United Kingdom, in Green, M. (Ed), Venture Capital: International Comparisons, London: Routledge, 202-247

- (1992), The Supply of Equity Finance in the UK: A Strategy for Closing the Equity Gap. Entrepreneurship and Regional Development 4, 357-380

- (1999), Financing Entrepreneurship: Venture Capital and Regional Development, in Martin, R. (Ed), Money and the Space Economy, Chichester: Wiley, 157-183

- (2001), Closing the Regional Equity Gap? A Critique of the Department of Trade and Industry's Regional Venture Capital Funds Initiative, Unpublished Manuscript, December 2001

- (2003), 'Investment Readiness': A Critique of Government Proposals to Increase the Demand for Venture Capital, Regional Studies 35, 7 (October), 663-668

Mayer, C. (1988), New Issues in Corporate Finance, in: European Economic Review, 32, 1167-1188

Mayer, M. and Müller, R (1991), Die Deutsche Wagnisfinanzierung-Gesellschaft mbH (WFG): Erfahrungen und Ergebnisse eines Modellvorhabens. Im Auftrag des Bundesministers für Forschung und Technologie vorgelegt vom Frauenhofer-Institut für Systemtechnik und Innovationsforschung (ISI) im Rahmen der Projektbegleitung zu den Modellversuchen "Beteiligungskapital für junge Technologieunternehmen" (BJTU) und Förderung technologieorientierter Unternehmensgründungen" (TOU), Karlsruhe: ISI

McKinnon, R.I. (1973), Money and Capital in Economic Development, Brookings Institution, Washington D.C.

Miles, D. (1993), Testing for Short Terminism in the UK Stock Market, Economic Journal, 103, 421

Minsky, H.P. (1957), Monetary Systems and Accelerator Models, American Economic Review 47, 6 (December), 859-83

Mishkin, F.S. (1978), The Household Balance Sheet and the Great Depression, Journal of Economic History, 38, 4 December, 918-937

Modigliani, F. and Miller, M.H. (1958), The Cost of Capital, Corporation Finance, and the Theory of Investment, American Economic Review, 48, 3 June, 261-297

Mojon, B. (2000), The Financial Structure and the Interest Rate Channel of ECB Monetary Policy, European Central Bank, Working Paper No. 40, November 2000

Moore, B.J. (1988), Horizontalists and Verticalist: The Macroeconomics of Credit Money, Cambridge: Cambridge University Press

Morley, B. (1998), Output, Consumption and the Stock Market: Implications for European Convergence, Department of Economics, University of Wales, Discussion Paper No. 98-3

Morishima, M. (1992), Capital and Credit: A New Formulation of General Equilibrium Theory, Cambridge, New York and Oakleigh: Cambridge University Press

Mullineux, A. (Ed) (1996), Financial Innovation, Monetary Aggregates and Monetary Policy, Edward Elgar

Murrey, G. (1993), The Second Equity Gap, UK Venture Capital Journal

- (1999), Early Stage Venture Capital Funds, Scale Economies and Public Support, Venture Capital, 1, 4, 351-384

Myers, S.C. and Majluf, N. (1984), Corporate Financing and Investment Decisions when Firms have Information that Investors Do Not Have, Journal of Financial Economics, 13, 2 June, 187-221

Neuberger, D. (2000), Regionalökonomik und Finanzierung kleiner und mittlerer Unternehmen: Erklärungen für ein Ost-West-Gefälle in Deutschland?, Konjunkturpolitik – Applied Economics Quarterly, 46 (1-2), 33-61

Neuberger, D., Lehmann, E., Räthke, S. (2001), Lending to Small and Medium-Sized Firms: Is there an East-West Gap in Germany? Unpublished paper, July 2001 forthcoming in: Small Business Economics 2002

Neuberger, D. and Lehmann, E. (2001), Do Lending Relationships Really Matter? Evidence from Bank Survey Data in Germany, Journal of Economic Behavior and Organisation, 45, 4 (August), 339-59

Nolte, B. and Stummer, F. (2000), Die Beteiligungskapialgesellschaften der Sparkassen auf dem deutschen Venture-Kapital-Markt, in: Zeitschrift für das gesamte Kreditwesen 53, 18, 1066-1067

- (2001), Die Venture-Capital-Aktivitäten deutscher Sparkassen, in: Sparkasse 118, 5, 211-213

O'Brien, R.M. (1979), The Use of Pearson's r with Ordinal Data, American Sociological Review, 44, 851-7

OECD (1996), Venture Capital and Innovation, Working Papers IV, no. 98, Paris: OECD

OECD (1997), Government Venture Capital for Technology-Based Firms, Paris: OECD/GD(97)201

Paley, T. (1996), Beyond Endogenous Money: Toward Endogenous Finance, in: Deleplace, G. and Nell, E.J. (Eds) (1996b), 516-531

Patinkin, D. (1961), Financial Intermediaries and the Logical Structure of Monetary Theory. A Review Article, American Economic Review, 51, 95-116

- (1965), Money, Interest and Prices. An Interpretation of Monetary and Value Theory, 2nd ed., New York

Petersen, M. and Rajan, R.G. (1994), The Benefits of Lending Relationships: Evidence from Small Business Data, Journal of Finance, 49, 1 March, 3-37

Pollin, R. (1991), Two Theories of Money Supply Endogenouty: Some Empirical Evidence, Journal of Post Keynesian Economics, 13, 366-396

Porteous, D.J. (1995), The Geography of Finance: Spatial Dimensions of Intermediary Behaviour, Avebury: Aldershot

PricewaterhouseCoopers (2000), Money for Growth: European Technology Report 1999, London: PWC

Radcliffe-Committee (1959), Report on the Working of the Monetary System. London: HMSO

Reid, G.C. (1999), The Application of Principal-Agent Methods to Investor-Investee Relations in the UK Venture Capital Industry, Venture Capital Journal, 1, 4, 285-302

Renversez, F. (1996), Monetary Circulation and Overdraft Economy, in: Deleplace, G. and Nell, E. J. (Eds) (1996b), 465-88

Riese, H. (1986), Theorie der Inflation, Tübingen: J.C.B. Mohr (Paul Siebeck)

- (1993), Bagehot versus Goodhart: Warum eine Zentralbank Geschäftsbanken braucht, Diskussionsbeiträge zur gesamtwirtschaftlichen Theorie und Politik, Neue Folge Nr. 22 Universität Bremen, English version forthcoming in Riese (2003)

- (2003 forthcoming), Money, Development and Economic Transformation: Selected Essays by Hajo Riese, edited by Hölscher, J. and Tomann, H., Studies in Economic Transition, New York: Palgrave

Roberts, R.B., Fishkind, H. (1979), The Role of Monetary Force in Regional Activity: An Econometric Simulation Analyses, Journal of Regional Science 19, 1 (February), 15-29

Romer, D. (1985), Financial Intermediation, Reserve Requirements, and Inside Money. A General Equilibrium Analysis, Journal of Monetary Economics, 16, 175-194

Ross, S.A. (1977), The Determination of Financial Structure: The Incentive Signalling Approach, The Bell Journal of Economics, 8,1 (Spring), 23-40

Samolyk, K.A. (1996), Banking and the Flow of Funds. Are Banks loosing Market Share? Economics Commentary, Federal Reserve Board of Cleveland, September 1996

Sauve, A. and Scheuer, M. (1999), Corporate Finance in Germany and France. A Joint Research Project of the Deutsche Bundesbank and the Banque of France, Frankfurt a.M. and Paris

Schertler, A. (2002), Comparative Advantages of Public Loan and Public Equity Schemes, Kiel Institute for World Economics Working Paper 1118, July

Schmidt, R. (2001), Differences between Financial Systems in Europe: Consequences for EMU, in Deutsche Bundesbank (Ed), The Monetary Transmission Process: Recent Developments and Lessons for Europe, London: Palgrave, 208-240

Schmidt, R., Hackthal, A., Tyrell, M. (1999), Disintermediation and the Role of Banks in Europe: An International Comparison, Journal of Financial Intermediation, 8, 1-32

- (2002), The Convergence of Financial Systems in Europe, in German Financial Markets and Institutions: Selected Studies, Special Issue 1-02 of Schmalenbach Business Review, 7-53

Schmidt, R. and Spindler, G. (2001), Path Dependence, Corporate Governance and Complementarity, in Gordon, J.M. and Roe, M. (Eds), Convergence and Persistence in Corporate Governance Systems, Chicago: University of Chicago Press

Schnad, N. (1994), The Domestic Money Markets of the UK, France, Germany and the US, Financial Market Group, LSE, January

Schneider-Lenné, E.R. (1992), Corporate Control in Germany, Oxford Review of Economic Policy, 8, 3 (Autumn), 11-23

- (1994), The Role of German Capital Markets and the Universal Bank, in: Dimsdale, N. and Prevezer, M. (Eds), Capital Markets and Corporate Governance, Oxford: Clarendon Press

Schroeder, U. and Schrader, A. (1998), The Changing Role of Banks and Corporate Governance in Germany: Evolution towards the Market, in Black, S. and Moersch, M. (Eds), Competition and Convergence in Financial Markets. The German and Anglo-American Models, Elsevier: North Holland

Scottish Enterprise (2002), Scottish Enterprise – Early Stage Equity Investment: The Scottish Co-Investment Scheme

Sickenberger, P. (2002), Risikokapital mit beschränktem Risiko: Die Innovations- und Beteiligungsfinanzierung in Deutschland. Jahrbuch Unternehmensfinanzierung 2003 (Gemeinsames Jahrbuch der Venture-Capital- und Private Equity-Verbände in Deutschland, Österreich und Schweiz). Covent GmbH (Hrsg.), Frankfurt/Main, 23-26.

Statistisches Bundesamt, Gewerbeanzeigenstatistik, Wiesbaden, (several years) www.destatis.de

Steinherr, A. and Huveneers, C. (1994), On the Performance of Differently Regulated Financial Institutions: Some Empirical Evidence, Journal of Banking and Finance 18, 2 (March), 271-306,

Stiglitz, J.E. (1988), Economics of the Public Sector, 2nd edition, New York/London: Norton

- (1992a), Banks versus Markets as Mechanism for Allocating and Coordinating Investment, in: Barr, S. and Roumasset, J.A. (Eds), The Economics of Cooperation, Asian Development and the Case for Pro-Market Intervention, Oxford: Westview Press, 15-38

- (1992b), Capital Markets and Economic Fluctuations in Capitalist Economies, European Economic Review 36, 2-3, 269-306

- (1993), The Role of the State in Financial Markets, Stanford University Press

Stiglitz, J.E. and Weiss, A. (1981), Credit Rationing in Markets with Imperfect Information, American Economic Review, 71, 3 June, 393-410

Stöß, E. (1996), Die Finanzierungsstruktur der Unternehmen und deren Realtion auf mönetäre Impulse. Eine Analyse anhand der Unternehmensbilanzstatistik der Deutschen Bundesbank, Volkswirtschaftliche Forschungsgruppe der Deutschen Bundesbank, Diskussionspapier 9/96

Stützel, W. (1979), Paradoxa der Geld- und Konkurrenzwirtschaft, Aalen: Scientia Verlag

Süddeutsche Zeitung (2002), Schlusspunkt im Bankenstreit, KfW trifft Vereinbarung mit Brüssel, Inländische Förderprogramme bleiben unangetastet/Exportfinanzierung wird ausgelagert, Montag 4.3.2002

Temperton, P. (1992), The London Money Markets, in: Cobham (1992), 138-162

Thakor, A.V. (1996), The Design of Financial Systems: An Overview, Journal of Banking and Finance, 20 June, 917-48

Tobin, J. (1963), Commercial Banks as Creators of Money, in: Carson, D. (Ed), Banking and Monetary Studies, Homewood: R.D. Irwin, 408-19

- (1969), A General Equilibrium Approach to Money, Journal of Money, Credit and Banking, 1 (February), 15-29, reprinted in: Tobin (1971), 323-338

- (1971), Essays in Economics, Volume 1: Macroeconomics, Amsterdam/London: North-Holland

- (1978), Monetary Policies and the Economy: The Transmission Mechanism, Southern Economic Journal, 44, 3 (January), 421-431, reprinted in: Tobin (1982), 3-31

- (1979), Deficit Spending and Crowding Out in Shorter and Longer Run, in: Greenfield, H.I. et al (Eds), Theory for Economic Efficiency: Essays in Honor of Abba P. Lerner, Cambridge, MA, 217-236, reprinted in: Tobin (1982), 161-180

- (1980), Portfolio Choice and Asset Accumulation, in: Tobin, J., Asset Accumulation and Economic Activity. Reflections on Contemporary Macroeconomic Theory, YRJÖ Jahnsson Lectures, Oxford, 73-96

- (1982), Essays in Economics. Theory and Policy, Cambridge (Massachusetts), London: MIT Press

Tobin, J. and Buiter, W. (1980), Fiscal and Monetary Policies, Capital Formation and Economic Activity, in: von Furstenberg, G. M. (Ed), The Government and Capital Formation, vol. II in the Series on Capital Investment sponsored by the American Council of Life Insurance, Cambridge, MA, 73-151, reprinted in: Tobin (1982) 181-259

Townsend, R.M. (1979), Optimal Contracts and Competitive Markets with Costly State Verification, Journal of Economic Theory, 21, 2 October, 265-293

Trautwein, H.M. (1997), The Credit View, Old and New. Diskussionsbeitrag Nr. 158, Institut für Volkswirtschaftslehre, Universität Hohenheim

Turner, A. (2001), Just Capital: The Liberal Economy, London: Macmillan

Virtanen, M. (1996), Entrepreneurial Finance and Venture Capital Advantage, Helsinki School of Economics and Business Administration, Acta Universitatis Oeconomicae Helsingiensis

von Osnabrugge, M. (2000), A Comparison of Business Angels and Venture Capitalist Investment Procedures: An Agency Theory-Based Analysis, Venture Capital, 2, 2 (April-June), 91-109

Vitols, S. (1995), Are German Banks Different? Discussion Paper FS 95-308, Wissenschaftszentrum Berlin für Sozialforschung

- (2004), Changes in Germany's Bank-Based Financial System. A Varieties of Capitalism Perspective. Discussion Paper SP II 2004-03, Wissenschaftszentrum Berlin für Sozialforschung

Walter, I. (1993), The Battle of Systems: Control of Enterprises and the Gobal Economy, Kieler Vorträge, Neue Folge 122, Institut für Weltwirtschaft

Walter, I. and Smith, R. (2000), High Finance in the Euro-Zone, London: Financial Times Prentice Hall

Wicksell, K. (1898), Geldzins und Güterpreise. Eine Studie über den Tauschwert des Geldes bestimmenden Ursachen, reprint Aalen 1968

Wilson Committee (1980), Committee to Review the Functioning of Financial Institutions, Final Report, London

Winger, A. (1969), Regional Growth Disparities and the Mortgage Market, Journal of Finance, 24, 4 (September), 659-62

Wray, L. R. (1990), Money and Credit in Capitalist Economies: The Endogenous Money Approach, Aldershot and Brookfield: Edward Elgar

Wright, M., Robbie, K., Mason, C., Harrison, R. (1999) Venture Capital in Europe, International Intellingence Reports, London: TSO.

Wupperfeld, U. (1997), Der Beteiligungskapitalmarkt in Deutschland, in: Koschatzky, K. (Ed), Technologieunternehmen im Innovationsprozeß, Heidelberg: Physica, 153-178

PERSONAL INTERVIEWS

3i, Düsseldorf, Herr Zollmarsch, Project Manager, 31 July 2002

3i, Frankfurt a.M., Thomas Paul, 23 June 2002 (conducted by Christian Berndt)

3i, Glasgow, Bruce Keith, Investment Director, 21 August 2002 (conducted by Peter Sunley)

3i, Hamburg, Andreas Deckmann, 30 August 2002 (conducted by Britta Klagge)

Barclays Bank, Urban and Regional Economic Development Unit, London, Mark Ford, Senior Manager, 23 August 2002

Bayerisches Staatsministerium für Wirtschaft, Verkehr und Technologie (BStMWVT), München, Ronald Mertz, Eric Zwintz and Daniel Curio, 11 July 2002 (conducted by Christian Berndt)

Bayern Kapital, Landshut, Dr Nathalie Götting, Project Manager, 14 August 2002 (conducted by Christian Berndt)

BC Brandenburg Capital GmbH, Potsdam, Michael Groß, Managing Director, 19 July 2002

BTG Hamburg, Stefan Papirow, CEO, 16 September 2002 (conducted by Britta Klagge)

Bundesministerium für Wirtschaft und Arbeit (BMWA), Bonn, Herr Faas and Neuhäusser, 22 April 2002

Bundesverband Deutscher Kapitalbeteiligungsgesellschaften (BVK), Berlin, Holger Frommann, Managing Director, 13 February 2002

Deutsche Ausgleichsbank - Technologiebeteiligungsgesellschaft (DtA-tbg), Bonn, Herr Jahn, 29 July 2002

Department of Trade and Industry (DTI), Small Business Service (SBS), Sheffield, Owen Fernandez, Economic Advisor, 13 February 2002

European Investment Fund (EIF), Brussels, 14 August 2002 (conducted by Peter Sunley)

Gap Fund Managers, Edinburgh, Nelson Gray, 23 September 2002 (conducted by Peter Sunley)

Heptagon Capital Beteiligungsgesellschaft der Freien Sparkassen mbH & Co. KG, Hamburg, Dr Thomas Keidel, CEO, 15 October 2002 (conducted by Britta Klagge)

IBB Beteiligungsgesellschaft (IBBBet), Berlin, Managing Director, Roger Bendisch, 15 July 2002

IKB Düsseldorf, Holger Schragmann, Project Manager, 24 May 2002 (conducted by Christian Berndt)

Innovative Medical Technology Centre (imtc) GmbH, Hamburg, Georg Thiessen, CEO, 17 September 2002 (conducted by Britta Klagge)

Kreditanstalt für Wiederaufbau (KfW), Frankfurt, Martin Koch, Referatsleiter, 1 November 2002

LfA Förderbank Bayern, Nürnberg, Herbert Antes, 10 June 2002 (conducted by Christian Berndt)

Maz level one GmbH, Hamburg, Michael Lübbehusen, 29 August 2002 (conducted by Britta Klagge)

MBG Berlin Brandenburg (Mittelständische Beteiligungsgesellschaft Berlin), Frau Wolf, Managing Director, 17 July 2002

Ministerium für Wirtschaft und Mittelstand, Energie und Verkehr des Landes NRW (MWMEV), Düsseldorf, Reiner Eisold, 24 May 2002 (conducted by Christian Berndt)

Northern Enterprise Limited, Gateshead, Barry Hensby, Ceo, 28 August 2002 (conducted by Peter Sunley)

OneNorthEast, Newcastle u.T., Karl Gardiner, Executive Corporate Finance, 5 July 2002 (conducted by Peter Sunley)

Scottish Equity Partners and Deputy Chair Scottish Enterprise, Neil Hood, 4 March 2002 (conducted by Peter Sunley)

Senatsverwaltung für Wirtschaft, Hamburg, Uwe Glatz, 15 February 2002 and 19 September 2002 (conducted by Britta Klagge)

Senatsverwaltung für Wirtschaft, Arbeit und Frauen, Berlin, Herr Paustian, Referatsleiter, 18 July 2002

West Midlands Enterprise, Birmingham, Martyn Booth, Manager, 15 October 2002

Westdeutsche Landesbank (WestLB), Düsseldorf, Wolfgang Freudenmann, Director Equity Investment, and Monika Hesse, Manager, 1 August 2002

WIN, Wagniskapital für Innovationen NRW GmbH, Düsseldorf, Dirk Meissner, Vice Managing Director, 31 July 2002

Yorkshire Fund Managers, Leeds, Nigel Barraclough, Investment Manager, 29 August 2002 (conducted by Peter Sunley)